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IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF	:
JACQUES QUELLAIS, ET AL.	: EXAMINER: PATTERSON, M.
SERIAL NO: 09/994,059	:
RCE FILED: MARCH 8, 2004	: GROUP ART UNIT: 3728
FOR: MULTILAYER SOLE FOR SPORT SHOES	:

DECLARATION UNDER 37 C.F.R. §1.132

COMMISSIONER FOR PATENTS
ALEXANDRIA, VIRGINIA 22313

SIR:

The undersigned declarant, Anne Laurent, states the following:

1. That she is employed in the Legal and Industrial Property department of Salomon, S.A. (hereinafter, "Salomon"), which is the assignee of U.S. patent 6,079, 125 (hereinafter, "the '125 patent").

2. That Wolverine World Wide of Rockford Michigan (hereinafter, "Wolverine"), a manufacturer of sport shoes, initiated a declaratory judgment action in the United States District Court for the Western district of Michigan, seeking a determination of non-infringement and invalidity of the '125 patent.

3. That on July 12, 2002 Wolverine agreed to a settlement of the declaratory judgment action and a settlement of a litigation in Germany, by which settlement Wolverine agreed to a payment of a certain sum to Salomon, to cease manufacture of certain existing "Exotech" footwear involved in the declaratory judgment action and the action in Germany, and to submit certain redesigned footwear to Salomon for preapproval.

4. That on February 2, 1997, which was after the date of publication of French patent application 91 16275, for which the '125 patent claimed priority under 35 U.S.C. § 119, Vibram, S.p.A., a manufacturer of sport shoes, filed a patent application in Italy which was the basis of the attached European patent publication EP 0 857 434 (Exhibit A). This publication describes a sport shoe sole incorporating a rigid insert 13 located between an outer layer and an inner layer.

5. Merrell, a Wolverine subsidiary, commercialized a sport shoe incorporating the Vibram technology after the issuance of the '125 patent. Referring to the attached English language advertisement of Merrell (Exhibit B), a sport shoe incorporating the Vibram sole has a rigid insert placed between a cushioned mid-sole and an outer sole layer to enhance lateral stability and diffuse stress at impact points.

6. That on August 12, 1994, which is also subsequent to the date of publication of French patent application 91-16275, another competitor, "One Sport," filed a patent application which was published as WO 96/04811. WO 96/04811 (Exhibit C) exhibits a three layer construction including an intermediate stiffener 36. This technology has subsequently been commercialized by Montrail, particularly in their Traverse GTX and Blue Ridge GTX shoes (Exhibit D).

7. "Ecco," "Columbia," "Garmont," "Montrail" (additional shoe models), "Nike," "TSL," "Vasque" and "Zamberlan have also recently commercialized a shoe believed to have a three layer construction including an intermediate stiffener directly in contact with a ground contact layer (Exhibits E-L)."

8. The undersigned declares further that all statements made herein of her own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of this application or any patent issuing thereon.

August 4th, 2005
Date

Anne Laurent

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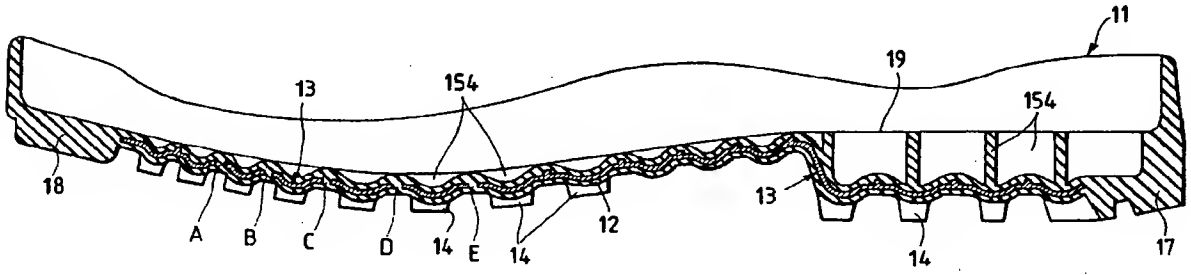
(54) High-traction sole unit

(57) A high-traction sole unit, comprising a rubber tread (12) and a series of more or less rigid lattice inserts (13), which are separated among them by cavities (A, B, C, D, E) and each of them is composed of undulated elements and a series of inverted T-shaped transverse ribs (15), the axes (151) of which are perpendicular, at the points of relative intersection, to an S-shaped curved line (16) extending from the heel (17) to the toe (18) of the sole unit (11); the lattice inserts (13) are joined together by rubber or elastomeric elements, which are constituted by the same material that constitutes the tread (12) or the wedge of the footwear. To usefully lighten the structure, further ribs (154) of rubber are provided, differing from each other in shape and dimensions, which are suitably located within concavities in the inserts (13); finally the lattice inserts (13) can be constructed of different materials, such as carbon fibre or fibre-filled plastic material or metal materials.

Fig.5



EP 0 857 434 A1

Exhibit A
Declaration of Anne Laurent
U.S. Application Serial No. 09/994/059

Printed by Jouve, 75001 PARIS (FR)

Description

This invention relates to a high-traction sole unit. Sole units of various forms are known which, at various times and by differing arrangements have sought to improve foot comfort or protection for the foot of the shoe user.

For example, for walking shoes it has been sought to insert elements of greater or lesser softness into the sole unit and into the shoe to improve comfort. In other cases, for example of anti-accident shoes, protection elements have been inserted to protect the foot by surrounding it.

Alternatively, such protection devices are positioned above the foot to protect it from heavy objects or, generally, from crushing.

Particularly in the case of mountain or sports footwear there is a requirement for achieving considerable traction accompanied by good sensitivity and stability on the ground, followed by good absorption of impact force during the step.

In view of this, an object of the invention is to provide a high-traction sole unit, in particular for mountain or sports footwear, which facilitates correct bearing of the foot and prevents poor and incorrect walking.

A further object is to provide a sole unit which prevents foot fatigue, particularly during lengthy stressing, by controlling its torsion during movement and improving the footwear grip on slopes and/or rough ground, compared with the known art.

A further object of the present invention is to provide a sole unit of differential reaction, the support effect of which is suitably varied in the various sole portion regions with reference to bearing, braking and thrust forces.

These and further objects are attained, according to the present invention, by a high-traction sole unit, in particular for mountain or sports footwear, in accordance with claim 1, to which reference should be made for brevity.

Advantageously, to better analyse the foot geometry, its point of articulation and its movement during mountain walking, a study was made of the parameters relative to the angles of incidence which have to be taken into consideration in designing the sole unit, together with the geometry of the rolling axis resulting in identification of the minimum characteristics of a possible mix.

A series of lattice inserts are positioned within the sole unit as close as possible to the ground, so as to reduce to a minimum the elastic element interposed between the part connected to the vamp and the bearing surface, using the tread essentially as an antislip element and giving the inserts the task of controlling the elasticity of the system.

The insertion of elastic elements (rubber, plastic materials, thermoplastic materials with fibre filler) into the interior of the sole unit is of fundamental importance, as is also important that they be of different shape and size.

Preferably, the inserts are constructed by rigid material (a lamina) and each of them is composed of a series of transverse inverted-T ribs having their axis perpendicular to an S-shaped dorsal line ideally representing the rolling axis.

The axes are equidistant along the dorsal line, but because of their different inclination are at different distances apart along the outer edge of the insert. Their profile is therefore different on the outer and inner sides of the sole unit.

The inverted-T ribs provide the necessary transverse rigidity to the sole portion.

Rotation of the T-elements is guaranteed by rubber elements, which are rigidified by suitable rubber ribs for lightening the structure, these being positioned in the concavities of the inserts having different sizes and shapes, according to their location.

Hence, advantageously, in contrast with simple one-piece inserts co-moulded in the rubber, which can provide a single transverse or torsional rigidifying effect, with a high-traction sole unit, according to the invention, a differential system reaction is achieved, given by the combination of the rigidity of the inserts and the elasticity of the suitably shaped and positioned rubber, to consequently obtain a better foot torsion and foot flexion control and a reduction in walking fatigue.

The characteristics and advantages of a biomechanical sole unit according to the present invention will be more apparent from the description given hereinafter by way of non-limiting example, with reference to the accompanying schematic drawings, on which:

FIGURE 1 is a plan view from above of a series of lattice inserts positioned within a sole unit, according to the present invention;

FIGURE 2 is a plan view from below of the lattice inserts of Figure 1;

FIGURE 3 is a section on the line III-III of Figure 2;

FIGURE 4 is a plan view of a high-traction sole unit according to the present invention, showing the particular arrangement of the lattice inserts positioned within it;

FIGURE 5 is a partly sectional view of footwear comprising a sole unit according to the present invention, better showing schematically the particular arrangement of the lattice inserts positioned within it.

With reference to the said figures, a sole unit, constructed in accordance with the present invention, is indicated overall by 11. The sole unit 11 comprises essentially a tread 12 and a series of relatively rigid lattice inserts 13.

In this way, the sole unit 11 comprises an inlay, which is separated in several parts or inserts 13 by means of cavities A, B, C, D, E.

The possible distance between each single insert

13 can be about 1 mm, while the thickness of the inserts can be varied along the transversal profile (such embodiment is not shown in figures).

In a preferred but non-limiting embodiment, each insert 13 consists of an element in the form of a lamina, having a semicircular outline.

The inserts 13 follow respective undulate outlines, which are arranged transversely to an imaginary axis of the sole unit 11 which extends longitudinally from the heel 17 to the toe 18.

Further the inserts 13 are joined together by rubber or elastomeric elements, which are constituted by the same material that constitutes the tread 12 and the wedge of the footwear.

The tread 12 can be patterned as variously shaped projecting studs 14 faceted with sharp edges to facilitate the hold on steep and/or uneven ground.

In any event, the pattern of the tread 12 is extremely simple and functional and is conceived as integration of the stiffening inserts 13, paying particular attention to the type of bearing surface. In this respect, having reduced the thickness of the rubber present below the inserts 13 to a minimum, a mix must be made up of very low abrasion and high elasticity, so that the said rubber operates within the sole unit 11 as an elastic element.

The lattice inserts 13 can be formed of different materials, such as carbon fibre, plastic material, or fibre-filled thermoplastic material, and are composed of a series of inverted T-shaped transverse ribs 15 the axis of which, indicated by 151, is perpendicular at the hypothetical intersection points to an S-shaped curved line, indicated by 16, similar to a backbone, positioned longitudinally to the sole unit 11 starting from the heel 17 and terminating at the toe 18. The curved line 16 represents ideally the rolling axis of the foot, the profile deriving from it following the natural region of flexure of the foot during walking.

In a non-limiting embodiment of the invention, within the heel 17 the inserts 13 can be positioned at a height slightly greater than the sole portion 19, so as to increase the height of the studs 14 of the heel 17.

The axes 151 of the ribs 15 are equidistant along the curved line 16, and because of their different inclination are at different distances along the outer edges 161 of the inserts 13. The profiles of the inserts 13 are therefore different on the outer side and inner side of the sole unit 11.

The inserts 13 and the ribs 15 are connected together on the upper side by a semicircular concave hinge element 152 which joins together the bases 153 of the T. The purpose of this hinge element 152 is to control the inserts 13 and the ribs 15 to rotate, its diameter depending on the height of the studs 14, such as to reduce to a minimum the thickness of the tread 12 and to eliminate to a maximum extent the elastic element interposed between the ground and said supporting inserts 13.

Transverse rigidity of the sole portion 19 is provided by the transverse ribs 15, which constitute the inserts 13.

Rotation of the hinge element 152 is stiffened by inserting suitable rubber lightening ribs of different width and shape according to their location, they being indicated by 154 and positioned in concavities within the inserts 13.

Hence, depending on their shape and their thickness, the combination of the rigid and elastic elements increases or decreases the supporting effect of the sole unit 11 in the various bearing, braking or thrusting regions (differential reaction).

The geometry of the undulated inserts 13, the dimensions of the various elements (inverted-T ribs 15, concave elements 152, bases 153, lightening ribs 154), the heights of the crests of each undulation from a horizontal plane and the type of material used for constructing the inserts 13 can vary on the basis of the type of target footwear and have been obtained from laboratory studies supported by mechanical and physical tests.

The nature and type of material of the inserts 13 are therefore directly related to final characteristics required by the user and depend on the torsional ridigity between the heel 17 and sole portion 19, the lateral flexing moment, the weight, the slip resistance, and the abrasion of the tread 12.

With particular reference to Figure 3, the schematic geometrical profile of the inserts 13 and their allocation are obtained empirically after a careful biomechanical and engineering examination of the technical characteristics required of a high-traction sole unit, in particular for mountain or sports footwear, namely relative flexibility in the longitudinal direction, good stability and rigidity in the middle-side region, substantial lightness, comfort, high traction and considerable absorption of the forces of impact with the ground.

In this respect, a sole unit 11 of this type must be able to withstand natural flexure forces which occur especially in the front region of the foot (metatarsus and phalanx joints) . This characteristic is particularly important during ascent walking.

Moreover, to always maintain the footwear and foot in stable positions, in particular during scrambling up uneven paths or up rocks, the sole unit 11 must present substantial rigidity along the lateral regions in correspondence with the central line of the foot, because in this case only small or narrow parts of these regions are in contact with the ground, these hence being the most stressed.

It is also apparent that the weight of the footwear considerably influences user performance, in the sense that the greater the weight of the sole unit 11 the greater is the energy expended during the walk.

Finally a further important characteristic required of the sole unit 11 for mountain footwear is comfort for the user, in that such footwear is worn only for a few hours. Again in this case, special physical characteristics of the sole unit 11, such as reinforcements positioned in re-

gions involving localized biomechanical forces and/or pressures, contribute towards improving the wearability and comfort of the footwear compared with traditional sole units.

The presence of the inserts 13 stiffens the middle and lateral regions of the sole unit 11 and, on the other hand, does not alter the longitudinal flexibility. However, this effect can be controlled by the rubber ribs 15, by suitably varying the thickness and their allocation or their radius.

The studs 14 of the tread 12 can be positioned in correspondence with the undulations of the inserts 13 and arranged essentially to follow the pattern of the ribs 15. Preferably, said studs 14 are arranged on the lower side of the undulations.

In preferred embodiments of the present invention, the top part of the profile of the inserts 13, between one transverse row of studs 14 and the next in the direction of the ribs 15, forms channel portions which facilitate lateral expulsion of mud and snow. In the heel 17, this part can form the framework of the studs 14 and enable the sole unit 11 to grip the ground with a hook effect.

It has thus been shown that by inserting relatively rigid undulated inserts 13 into the sole unit 11, an increase in load stability is achieved so increasing step stability during walking, particularly in climbing and on precipitous and uneven slopes. In addition, it reduces the concentration of localized loads, which can occur for example during walking on rock when the foot comes into contact with sharp projections or the like, so that the foot does not feel these projections.

Controls of the sole unit 11 flexion and torsion also considerably improve the grip of the tread 12 on the ground.

Consequently greater step stability and safety is achieved.

The resistance to lateral flexure provided by the sole unit 11 according to the present invention also aids the sensitivity of the foot in recognizing an unbalanced movement and opposing it, whereas the considerable transverse rigidity created by the large number and geometry of the inserts 13 increases the facility for edgewise walking on slopes.

With regard to the wedge or top of the footwear, this can be constructed of moulded rubber simultaneously with the tread 12.

Alternatively, it can be formed of low-density closed or open cell expanded material, also moulded simultaneously with the tread 12.

Again, this part of the footwear can be moulded separately from the tread 12 and at a different time. In this case it is glued later to the tread 12.

The constituent material of the wedge, besides supporting the footwear vamp, improves damping and absorption of impact forces during walking.

The undulated lattice inserts 13 are moulded either previously or during the moulding of the rubber, depending on the type of material used.

Finally, it should be noted that the mould by which the sole unit 11 is obtained, according to the present invention, is a mould analogous to those moulds normally used for moulding rubber sole units 11.

The characteristics of the high-traction sole unit, in particular for mountain or sports footwear, according to the present invention, are clear from the description, as are its resultant advantages. Specifically, these include:

- better lateral stability, compared with traditional sole units, during walking on uneven slopes or rock;
- better load distribution on the sole portion;
- good torsional rigidity and high traction at the foot articulation points during the movements required for effecting a step;
- high flexibility in the metatarsus region and the phalanx region of the foot toes;
- considerable damping of loads on the sole portion and relative absorption of impact forces on the sole unit at the moment in which ground contact occurs;
- substantial footwear lightness;
- adequate user comfort.

Finally, it is apparent that numerous further modifications can be made to the high-traction sole unit of the present invention without leaving the novel principles of the inventive idea, it also being apparent that in the practical implementation of the invention the materials, forms and dimensions of the illustrated details can be chosen according to requirements, and can be replaced by others technically equivalent.

Claims

1. A high-traction sole unit (11), in particular for mountain or sports footwear, of the type comprising a rubber tread (12) and at least one relatively rigid lattice insert (13) situated in the interior of said tread (12) and consisting of at least one lamina element comprising a series of successive undulations, said undulations being arranged transverse to at least one axis extending from at least one heel portion (17) to at least one toe portion (18), characterised in that said sole unit (11) comprises a plurality of lattice inserts (13), which are separated by cavities (A, B, C, D, E), said inserts (13) consisting of a plurality of said lamina elements.

2. A sole unit (11) as claimed in claim 1, characterised in that said undulations of said lamina elements, which consitute said inserts (13) comprise a series of crests having variously inclined transverse ribs (15).

3. A sole unit (11) as claimed in claim 2, characterised in that the axes (151) of said transverse ribs (15) are perpendicular, at the points of relative intersec-

tion, to an S-shaped curved line (16) similar to a backbone, positioned longitudinally to said sole unit (11).

4. A sole unit (11) as claimed in claim 1, characterised in that said inserts (13) are joined together by rubber elastomeric elements, which are constructed with the same material that constitutes said tread (12) or a wedge of said footwear.

5. A sole unit (11) as claimed in claim 2, characterised in that, when said lattice inserts (13) are viewed sideways, said transverse ribs (15) of said inserts (13) are of inverted-T shape.

6. A sole unit (11) as claimed in claim 3, characterised in that said axes (151) of the ribs (15) are equidistant along said curved line (16), whereas they are at different distances apart along the outer edge (161) of said inserts (13), so that the geometrical profile of said inserts (13) has a semicircular outline and it is of different shape and/or dimensions on the outer and inner sides of said sole unit (11).

7. A sole unit (11) as claimed in claim 2, characterised in that said transverse ribs (15) are connected together by at least one concave semicircular hinge element (152) which joins together the bases (153) of the inverted-T portions in pairs.

8. A sole unit (11) as claimed in claim 2, characterised in that studs (14) are positioned in correspondence with said undulations of the lattice insert (13).

9. A sole unit (11) as claimed in claim 8, characterised in that said studs (14) are positioned substantially to follow the path of said ribs (15) and their axes (151).

10. A sole unit (11) as claimed in claim 8, characterised in that said studs (14) are positioned in correspondence with the bottom of said undulations of the lattice insert (13).

11. A sole unit (11) as claimed in claim 8, characterised in that, in correspondence with said heel portion (17), said lattice inserts (13) are positioned at a height slightly greater than that in correspondence with a sole portion (19), so enabling those studs (14) positioned below the heel portion (17) to have a greater height than those positioned below said sole portion (19).

12. A sole unit (11) as claimed in claim 7 and 8, characterised in that the diameter of said hinge element (152) depends on the height of said studs (14).

13. A sole unit (11) as claimed in claim 1, characterised in that said lattice inserts (13) are positioned as close as possible to the ground.

14. A sole unit (11) as claimed in clain 1, characterised in that said lattice inserts (13) are separated, one from the other, by a distance of about 1 mm.

15. A sole unit (11) as claimed in claim 1, characterised in that said lattice inserts (13) have a non-uniform thickness, said thickness varying along a transversal profile with respect to said sole unit (11).

16. A sole unit (11) as claimed in claim 2, characterised in that rubber ribs (154) are provided in correspondence with concavities in said lattice inserts (13) to lighten the structure, and at the same time to control the rotation of said transverse ribs (15), each of said concavities being situated between two successive crests of the undulations of said inserts (13).

17. A sole unit (11) as claimed in claim 15, characterised in that said rubber ribs (154) are of different shape and/or dimensions, depending on their location in the lattice inserts (13).

18. A sole unit (11) as claimed in claim 1, characterised in that said lattice inserts (13) are constructed of plastic or thermoplastic material.

19. A sole unit (11) as claimed in claim 18, characterised in that said inserts (13) of plastic material has a composition containing reinforcing glass fibre or carbon fibre fillers in variable quantity, length and/or orientation.

20. A sole unit (11) as claimed in claim 1, characterised by comprising, above said tread (12) and inserts (13), an upper portion formed of rubber moulded simultaneously with said tread (12), or of low-density closed or open-cell expanded material moulded simultaneously with said tread (12), or alternatively said upper portion is moulded separately and later glued to said tread (12).

Fig.1

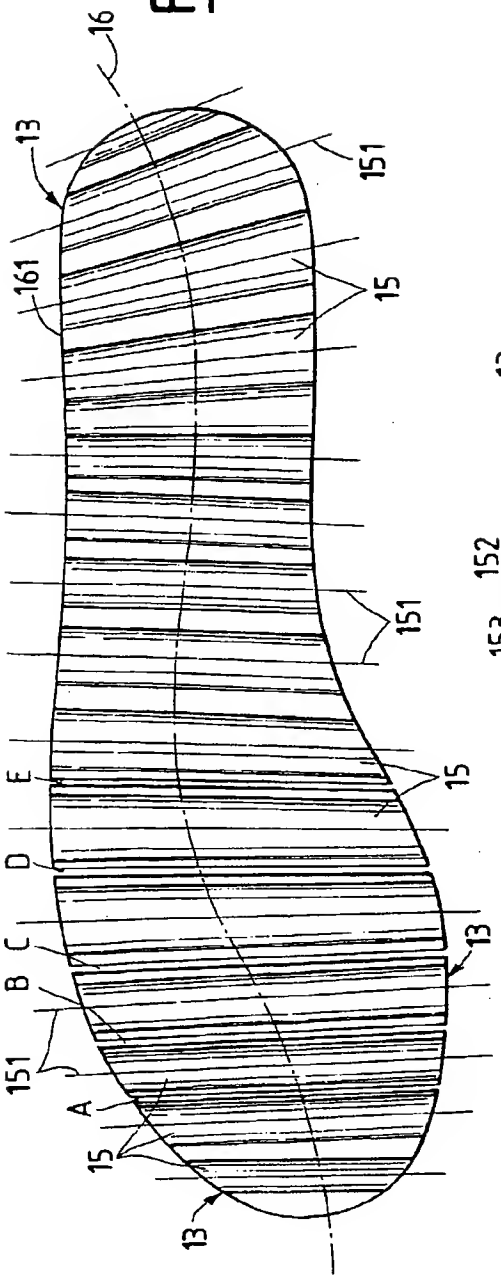


Fig.3

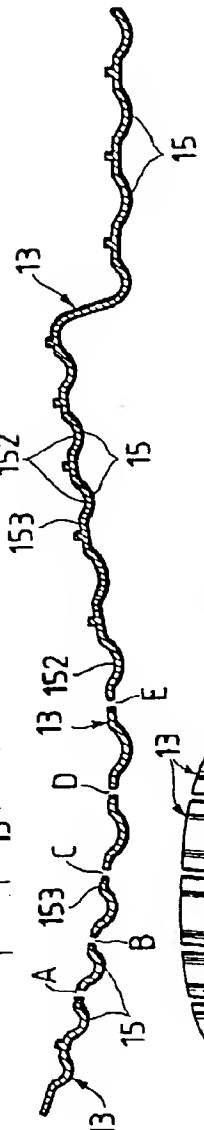
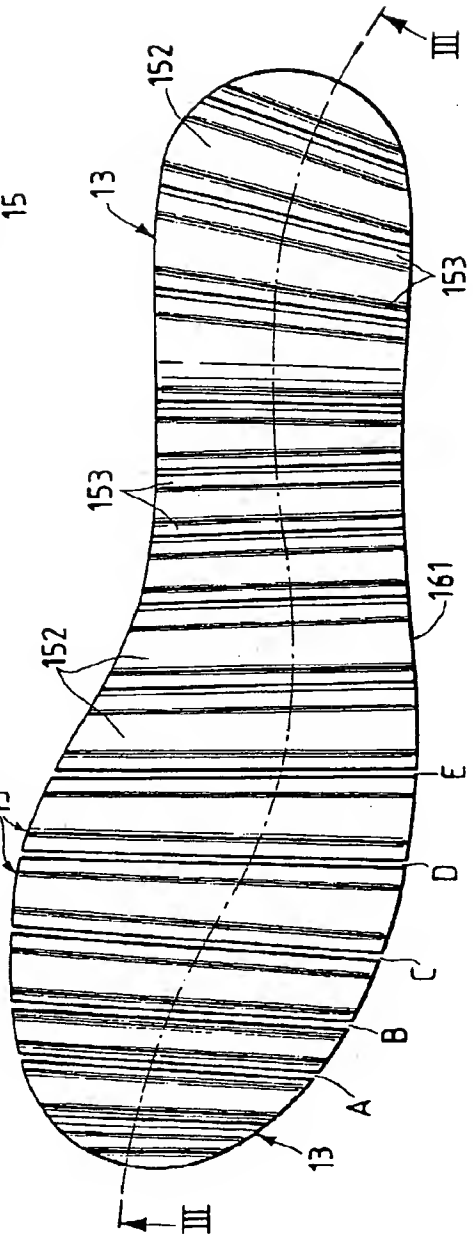


Fig.2



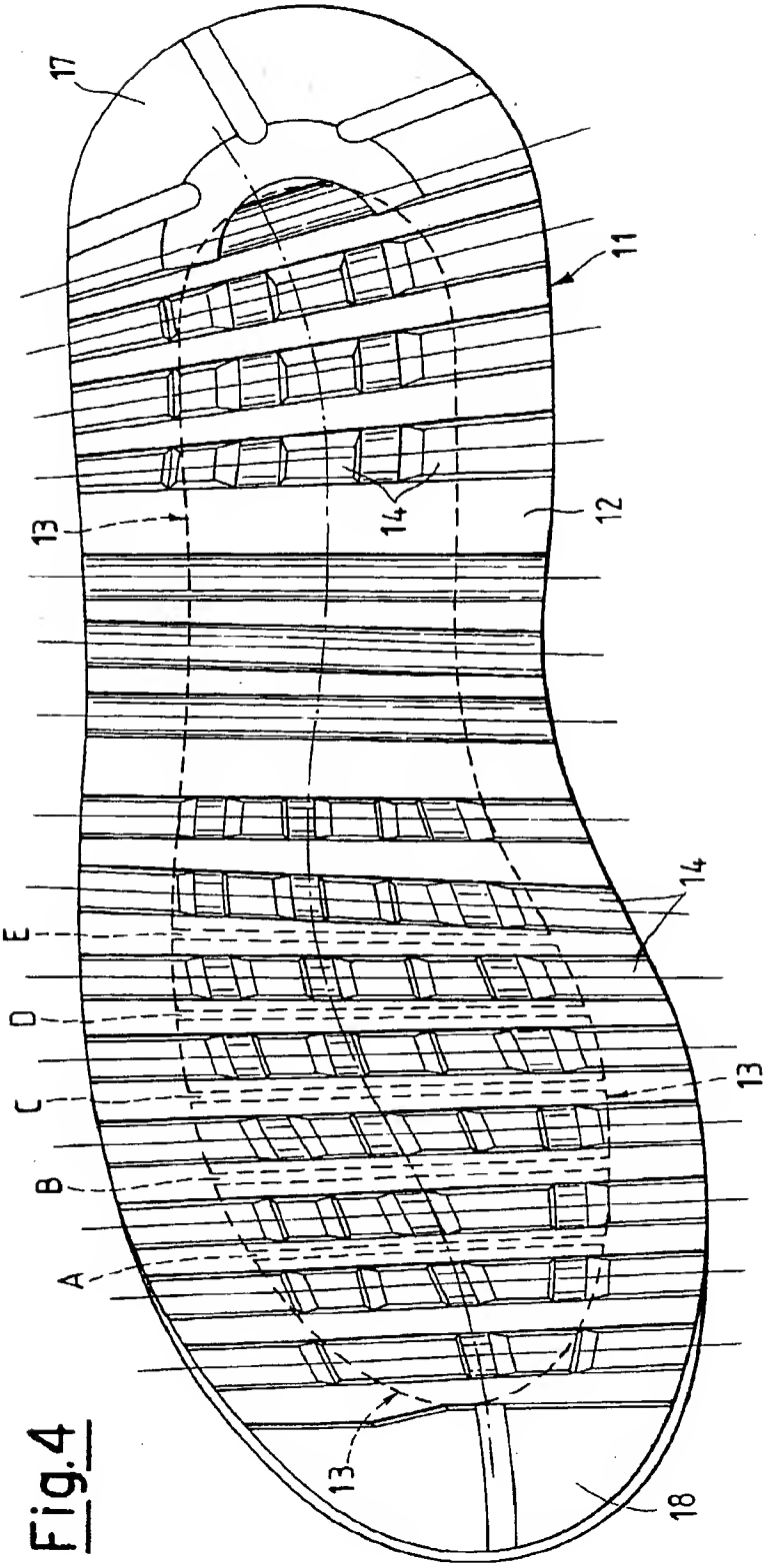
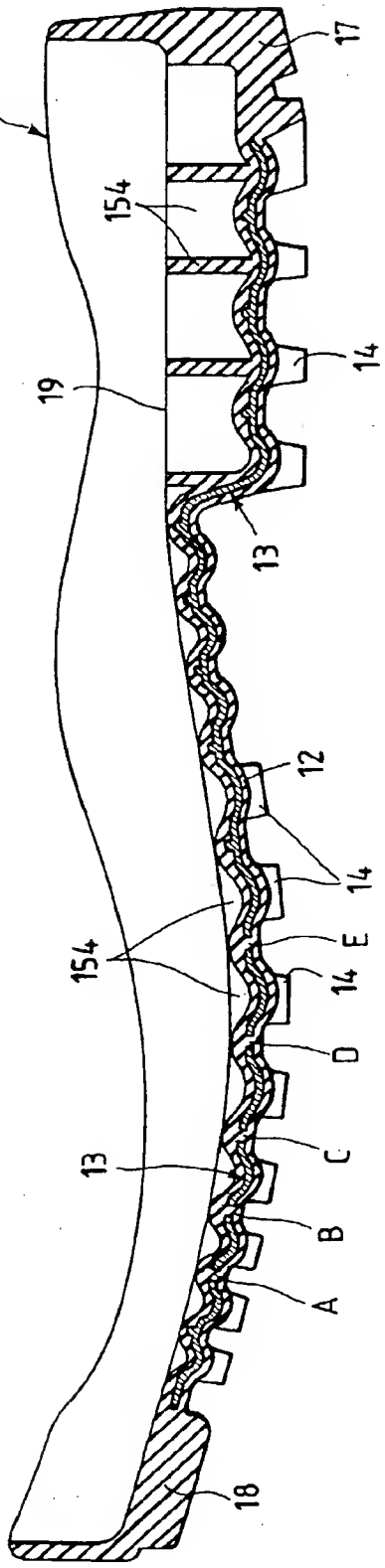


Fig.4

Fig.5



European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 98 20 0349

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A	EP 0 373 330 A (H. MAYER) 20 June 1990 * the whole document *	1	A43B13/12 A43B17/04
A	EP 0 434 076 A (H. MAYER) 26 June 1991 * the whole document *	1	
A	DE 91 10 849 U (S. SCHWEIKERT) 9 January 1992 * the whole document *	1	
A	US 4 561 195 A (KENJI ONODA) 31 December 1985 * the whole document *	1	

TECHNICAL FIELDS SEARCHED (Int.Cl.6)

A43B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	4 May 1998	Declerck, J

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

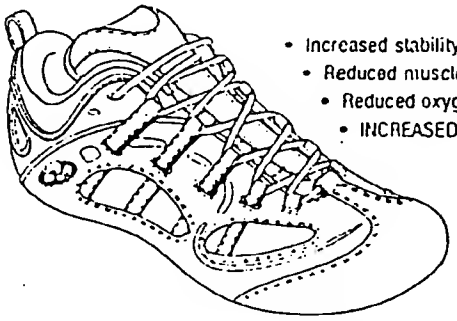
Anlage: L8
z.Schriftsatz v. 2.2.2001
i.S. SALOMON
Aktenzeichen:

20 TRAIL RUNNING

MERRELL EXÓTECH TECHNOLOGY

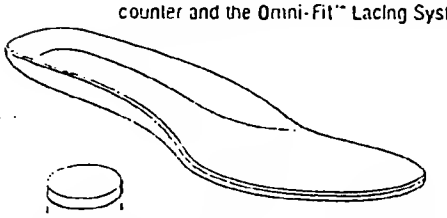
The Merrell Exótech sets the new standard for innovation and technology in the Trail Running category. The combination of a sleek, supportive upper; anatomical footbed; triple density midsole; integrated nylon insert and an exclusive, patented Vibram® sole provides an unbeatable performance package.

The active sole components guide your feet dynamically and work with you to make you a more efficient runner. The integrated insert's unique design, combined with a selective outsole compound helps your feet make the correct movements, resulting in:

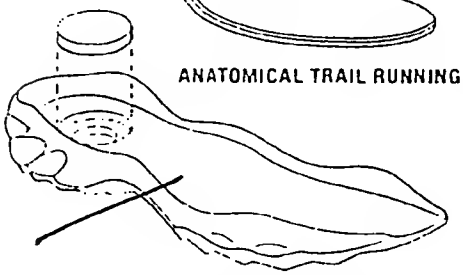


- Increased stability, control and comfort
- Reduced muscle stress and fatigue
- Reduced oxygen consumption
- INCREASED PERFORMANCE

SYNTHETIC LEATHER/MICRO-MESH UPPER
Features a sculpted backstay, micro-injected heel counter and the Omni-Fit™ Lacing System.

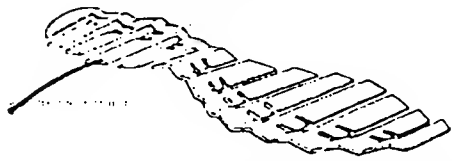


ANATOMICAL TRAIL RUNNING FOOTBED



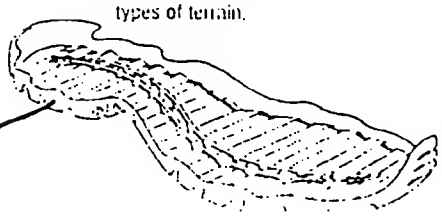
8

TRIPLE DENSITY EVA AIR CUSHION MIDSOLE
Provides optimal cushioning from the heel strike through the entire stride.



9

FULL LENGTH NYLON-6 SPINE/RIB
Placed beneath the triple density midsole, this insert provides optimal stability and control on all types of terrain.



7

VIBRAM® MOTOVATOR™ SOLE
In combination with the nylon-6 spine/rib, this sole features breakthrough, patented technology and is exclusive to Merrell for trail running.

EXÓTECH
OTHER FEATURES

- Trail Running Speed Last
- Combination Lasted Construction
- Synthetic Leather
- Heavy Nylex Lining
- Omni-Fit™ Lacing System
- Injection Molded Nylon 6 Rearfoot Stabilizer
- Triple Density Compression Molded EVA Footframe

Men's: 1 lb. 12 ozs.
Women's 1 lb. 8 ozs.

Exhibit B
Declaration of Anne Laurent
U.S. Application Serial No. 09/994/059

PCT WORLD INTELLEC In

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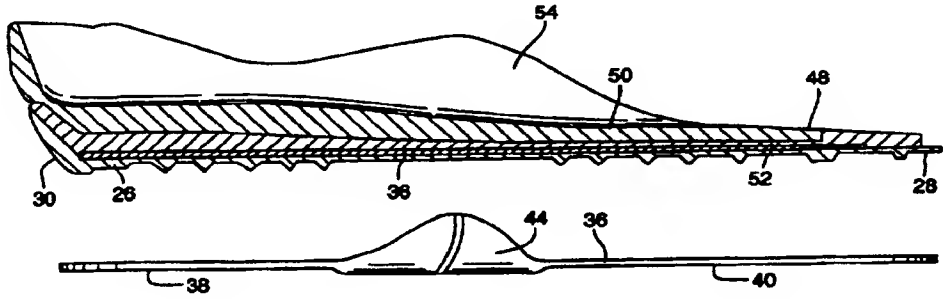
(54) Title: FOOTWEAR



(57) Abstract

The present invention comprises a shoe or boot having a lightweight stiffener (36) of graduated rigidity located between the outsole (26) and the midsole (48) to provide torsional rigidity and heel support. The outsole is provided with lugs in the heel area which independently telescope upwards into the midsole, thereby enhancing cornering and traction on uneven terrain.

Exhibit C
Declaration of Anne Laurent
U.S. Application Serial No. 09/994/059

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FOOTWEAR

Field of the Invention

The present invention relates generally to the field of footwear and more particularly, in many aspects, to footwear for use on uneven terrain.

Background of the Invention

Footwear for use on uneven terrain, such as that found off-road or on trails, must provide sufficient traction and torsional rigidity to avoid ankle or knee discomfort or injury resulting from excessive pronation, supination or boot instability. In addition, the shoe or boot must be rigid enough to avoid penetration by jagged rocks, pebbles, etc., and yet provide sufficient cushioning to attenuate and dissipate the ground reaction forces encountered in the heel and metatarsal areas of the foot when impacting the ground. This is particularly important in speed hiking or trail running, when the force with which the wearer impacts the ground may be as high as three to four times his or her body weight.

As illustrated in Figure 1, conventional hiking boots comprise a midsole 10 directly attached to a deeply lugged outsole 12. The upper component of the boot 14 is shaped and sized to receive a wearer's foot, and is wrapped around a rigid, hard lasting board 16 prior to being cemented or stitched to the midsole/outsole unit. Lasting board 16 is of uniform stiffness, generally underlies all areas of the foot, and is typically constructed of nylon or Texon board. In addition, the boot may have a shank under the heel. Cushioning is provided by midsole 10 and sockliner 18, which is placed on top of lasting board 16 and contacts the wearer's foot.

Sockliner 18 is typically constructed of ethylvinyl acetate (EVA) or polyurethane foam. The cushioning provided by midsole 10 is largely offset by the placement of the stiff lasting board 16 between the midsole and the foot. Conventional hiking boots are therefore both heavy and uncomfortable to wear.

An additional problem encountered with conventional hiking boots is a lack of compliance with uneven terrain due to the stiffness of the boot. The wearer must compensate for this lack of compliance by means of muscular control. This in turn leads to muscle fatigue. The lack of compliance in conventional hiking boots additionally leads to excessive wear on the outsole.

In contrast, most athletic shoes, such as running shoes, are lightweight and flexible due to the use of lightweight outsole/midsole units slip lasted to the upper component of the shoe. Slip lasting generally eliminates the use of a lasting board, which improves the cushioning of the shoe. However, this design also results in a significant reduction in the shoe's torsional rigidity and heel support, making the shoe inadequate for use on rugged or uneven terrain.

Thus there continues to be a need in the art for footwear which is lightweight and comfortable to wear, reduces muscle fatigue, yet provides a sufficient degree of traction and torsional rigidity for use on uneven terrain.

Summary of the Invention

An objective of the present invention is therefore to provide footwear which reduces muscle fatigue and the occurrence of ankle and knee injuries when hiking or running on uneven terrain.

A further objective of the present invention is to provide footwear having both high torsional rigidity and forefoot flexibility.

Another objective of the present invention is to provide footwear suitable for trail use with sufficient cushioning to attenuate and dissipate the ground reactive forces generated during speed hiking or running.

Yet a further objective of the present invention is to provide footwear that demonstrates a high degree of compliance with uneven terrain, thereby providing good traction and cornering.

An additional objective of the present invention is to provide such footwear that is lightweight, comfortable to wear, and can be manufactured for a moderate cost.

These and other objectives are achieved according to the present invention by placing a lightweight stiffener between the midsole and the outsole of the shoe or boot, and providing an outsole that interacts with the stiffener to provide a self-levelling feature. The placement of the stiffener between the outsole and midsole provides the torsional rigidity and heel support required for use on uneven terrain without compromising the cushioning provided by the midsole. Elimination of the stiff and heavy lasting board used in conventional hiking boots additionally leads to reduced weight. The stiffener is preferably constructed of a hard, semi-rigid material, such as a plastic material, and most preferably nylon 6, nylon 66, fiberglass, carbon fiber or some amalgam thereof. In a preferred embodiment, the stiffener has graduated rigidity along its longitudinal axis, with the heel area being more rigid than the metatarsal area, thereby providing greater

flexibility in the forefoot area. This is preferably achieved by varying the thickness of the stiffener, with the heel area being thicker than the metatarsal area. However, graduated rigidity can also be accomplished by other methods, such as use of a composite material.

Forefoot flexibility may also be provided by means of a series of perforations or slots located in the metatarsal region of the stiffener and oriented generally perpendicular to the longitudinal axis of the boot. The stiffener preferably has medial and lateral flanges in the central or arch area of the shoe or boot to provide additional support and permit use of a lighter weight outsole.

The outsole of the boot comprises a multiplicity of deep cut lugs, or active tread elements, attached to a thin rubber membrane. The stiffener is cut away in the area of the lugs located on the rear, or heel, of the outsole, to enable each lug to telescope upward into the midsole. Each of the rear, or outrigger, lugs is thus able to comply with the uneven terrain in an independent manner, much like the independent suspension system in high performance automobiles. This enhances the ability of the shoe or boot to corner and provide traction on angled and uneven surfaces.

The midsole of the boot or shoe of the present invention is constructed of two or more materials having different hardness or rigidity, preferably dual density foam. The bottom layer of the midsole comprises a softer, lower density material and is in contact with both the stiffener and the outrigger lugs on the outsole, thereby improving the independent suspension and shock absorbing properties of the lugs. The upper layer of the midsole is positioned closer to the sockliner and to the wearer's

foot, further insulating the foot from shocks while improving cushioning and support. In a preferred embodiment, the midsole is constructed of polyurethane (PU) with the bottom layer being constructed of PU having a durometer of about 60 to 65 and the upper layer constructed of PU having a durometer of about 25 to 40.

The upper component of the shoe or boot is constructed of a durable material such as leather, fabric (such as nylon, synthetic leathers, plastics, lycra, COOLMAX™ and/or neoprene), other materials such as GORETEX™ or SYMPATEX™ or a combination thereof, depending on the desired characteristics of the particular shoe or boot. In a preferred embodiment, the upper component is slip lasted, and then cemented to the platform formed by the outsole, stiffener and midsole to provide maximum flexibility at minimum weight. Alternatively, the upper component may be slip lasted with a glued-in tuck board, and then cemented to the outsole/stiffener/midsole platform to provide some additional torsional stability at the cost of a slight weight gain. Techniques and materials for slip lasting which may be usefully employed with the present invention are well known in the art.

The above-mentioned and additional features of the present invention and the manner of obtaining them will be best understood by reference to the following more detailed description read in conjunction with the accompanying drawings.

Brief Description of the Drawings

Figure 1 is an exploded view of a prior art boot having a lasting board positioned between the midsole and the sockliner.

Figure 2 is a schematic side view of a preferred

shoe of the present invention.

Figure 3 is a schematic view of the lower surface of a preferred outsole of the present invention.

Figure 4 is a schematic cross-sectional view of a preferred outsole/stiffener/midsole platform of the present invention.

Figures 5A and 5B are schematic side and top views, respectively, of a preferred stiffener of the present invention.

Detailed Description

A preferred outdoor shoe constructed in accordance with the present invention is illustrated in Figure 2. Upper component 20 is shaped and sized to receive a wearer's foot, and has a toe area 22 at its front end and a heel area 24 at its rear end. Upper component 20 may be constructed from a durable material, such as leather, fabrics or other materials, or a combination thereof, depending upon the desired characteristics of the shoe. Suitable fabrics include synthetic leathers, nylon, GORETEX™, SYMPATEX™, COOLMAX™, lycra and neoprene. Other materials for the construction of upper components of footwear are known in the art and may be usefully employed in the present invention.

Outsole 26 extends the length of the shoe between toe area 22 and heel area 24, and has a toe end 28 and a heel end 30. Outsole 26 is constructed of material which provides good traction on uneven terrain in variable weather conditions, such as VIBRAM™ or, preferably, GOODYEAR INDY 500™ rubber. As illustrated in Figures 2 and 3, outsole 26 is provided with a multiplicity of deep lugs 32, attached to and separated by a thin rubber membrane 34, preferably of approximately 1.5 mm thickness.

Suitable lugs 32 may be of various configurations and preferably project from both the lower and sidewall surfaces of outsole 26. Heel projection 33 is provided to reinforce and stabilize the heel area. Lugs 32 are capable of moving independently from one another and from heel projection 33.

Outsole 26 is preferably provided with a plurality of V-shaped projections 35 in the center of the heel and forefoot areas between opposing lugs 32. V-shaped projections 35 are positioned generally perpendicular to the antral longitudinal axis of outsole 26 and are of graduated size. As illustrated in Figure 3 V-shaped projections 35 in the heel area are arranged such that smaller projections are interposed between larger projections. In the forefoot area, a series of V-shaped projections is provided that is graduated in size, with the largest projection closest to toe end 28. Additional V-shaped projections may also be provided in the forefoot area and may be provided in conjunction with projections having other configurations, such as generally semispherical knobs 37.

In a preferred embodiment, outsole 26 is additionally provided with a plurality of generally semi-spherical knobs 37 in the metatarsal area and toe area 28 to provide good toe-off traction. The plurality of knobs 37 may also be graduated in size and may be provided on both the lower surface and the sidewall of outside 26. The heel sidewall of outsole 26 may be slightly rounded to enhance the stability of the shoe.

Stiffener 36 of the present invention extends along longitudinal axis of the shoe and is positioned between outsole 26 and midsole 48 as shown in Figure 4. The outsole, stiffener and midsole are joined together to

form a platform typically using a cementing technique involving heat and pressure using techniques and materials well known in the art. Stiffener 36 is constructed of a lightweight, semi-rigid and durable material, such as nylon 6, nylon 66, fiberglass or carbon fiber, or a combination thereof. Stiffener 36 preferably has varying properties of flexibility or rigidity along its longitudinal axis, providing greater flexibility in metatarsal area 40 than in heel area 38. According to a preferred embodiment, graduated flexibility is achieved by graduating the thickness of stiffener 36, with heel area 38 being thicker (preferably about 2.5 mm) and therefore more rigid, tapering to a thinner metatarsal area 40 (preferably about 1.5 mm thick) with proportionally more flex. Other means of providing a stiffener having different flexibility properties along its longitudinal axis, such as providing slots or perforations, using composite materials, and the like are well known in the art. A stiffener having graduated flexibility along its longitudinal axis, as described herein, may also be usefully employed with other kinds of footwear.

In the embodiment illustrated in Figure 5B, stiffener 36 is provided with a plurality of perforations or slots 42 in metatarsal area 40, each slot being oriented generally perpendicular to the longitudinal axis of the shoe. The exact number, size and pattern of the perforations is determined by the desired flexibility of the shoe. In a preferred embodiment, stiffener 36 has one or more slots oriented generally perpendicular to the longitudinal axis of stiffener 36. According to a preferred embodiment, 2 or 3 slots may be provided, each being approximately 3.5 mm wide. Both the medial and lateral sides of stiffener 36 are preferably provided with

angled flange 44 in the central or arch section of the shoe, thereby providing increased support for the foot while enabling use of a lower weight outsole. Angled flanges 44 preferably project from opposing sides of the arch section at an angle of from about 110 to about 170 from the plane of the arch section.

Stiffener 36 is cut-away in the region immediately above lugs 32 in heel area 38 to form channels 45. Lugs 32 are thus able to telescope upwards between torsion bars 46 and into midsole 48 in an independent manner, thereby enhancing the ability of outsole 26 to comply with uneven terrain.

Midsole 48 is constructed of two materials having different rigidities, preferably dual density foam. Upper layer 50 comprises a more rigid material, such as a harder, higher density foam, while lower layer 52 comprises a less rigid material, such as a softer, lower density foam. In a preferred embodiment, upper layer 50 is constructed of polyurethane having a durometer of about 25-40 and lower layer 52 is constructed of polyurethane having a durometer of about 60-65. Midsole 48 is preferably constructed, using a conventional 2-step mold process, of polyether polyurethane having a specific gravity of between about 0.25 to 0.30 in order to resist hydrolysis. The dual-rigidity construction of midsole 48 provides support and cushioning without the need for a lasting board or a tuck board between the foot and midsole 48.

Sockliner 54 is located above midsole 48 and contacts the wearer's foot. Sockliner 54 is preferably removable and is constructed of EVA, polyurethane or other materials well known in the art. Referring to Fig. 2, upper shoe component 20 is preferably slip lasted by means

of a conventional slip lasting process. The slip lasting process (sometimes referred to as California lasting) involves the insertion of a last into a completely sewn upper, thus forcing the upper to assume the shape of the last. In effect, the fabric slip sock at the bottom of the upper takes the place of the lasting board. The upper is then cemented to the outsole/stiffener/midsole platform.

Other techniques for attaching upper shoe component 20 to the outsole/stiffener/midsole platform are known in the art and may be usefully employed with the present invention. For example, upper shoe component 20 may be slip lasted and cemented to the outsole/stiffener/midsole platform with the addition of a tuck board to the fabric slip sock at the bottom of the upper. This provides additional torsional rigidity but increases the weight of the shoe or boot slightly.

While the characteristics of the footwear of the present invention are particularly beneficial for hiking or running on uneven terrain, it is apparent that the footwear of the present invention may be usefully employed for other applications.

Although the present invention has been described in terms of specific embodiments, changes and modifications can be carried out without departing from the scope of the invention which is intended to be limited only by the scope of the appended claims.

Claims

1. Footwear, comprising:

(a) an outsole having an upper surface and a lower surface, the lower surface designed for contact with the ground;

(b) a stiffener of graduated rigidity positioned on the upper surface of the outsole and extending along a longitudinal axis of the footwear to provide torsional rigidity and heel support;

(c) a midsole positioned above the stiffener and adhered to at least a portion of the outsole; and

(d) an upper component sized and shaped to receive a foot of a wearer and attached to at least a portion of the midsole or outsole.

2. Footwear having a heel area, an arch area and a metatarsal area, the footwear comprising:

(a) an outsole having an upper surface and a lower surface, the lower surface comprising a multiplicity of lugs;

(b) a midsole positioned above the upper surface of the outsole and adhered to at least a portion of the outsole;

(c) a stiffener positioned on the upper surface of the outsole and extending along a longitudinal axis of the outsole, the stiffener having a plurality of torsion bars corresponding to the lugs in the heel area, whereby the lugs in the heel area are able to telescope in a generally vertical direction between the torsion bars and into the midsole; and

(d) an upper component sized and shaped to receive a foot of a wearer and attached to at least a portion of the midsole or outsole.

3. The footwear of claim 2 wherein the upper component is attached to the midsole by means of slip lasting.

4. The footwear of claim 2 wherein the stiffener comprises a metatarsal area and a heel area and is of graduated rigidity, with the heel area being of greater rigidity than the metatarsal area.

5. The footwear of claim 2 wherein the stiffener comprises a metatarsal area having a plurality of perforations oriented generally perpendicular to the longitudinal axis of the outsole to provide flexibility.

6. The footwear of claim 2 wherein the stiffener comprises an arch area having one or more flanges to provide additional support.

7. The footwear of claim 2 wherein the stiffener comprises a material selected from the group consisting of nylon 6, nylon 66, fiberglass, carbon fiber or an amalgam thereof.

8. The footwear of claim 2 wherein the outsole comprises a material selected from the group consisting of GOODYEAR INDY 500™ rubber and VIBRAM™.

9. The footwear of claim 2 wherein the midsole comprises an upper layer of a material having a first density and a lower layer of a material having a second density lower than the first density.

10. The footwear of claim 9 wherein the upper layer comprises a material having a durometer of about 25 to about 40 and the lower layer comprises a material having a durometer of about 60 to about 65.

11. The footwear of claim 2 wherein the midsole comprises polyurethane.

12. A platform for use in footwear, comprising:

(a) an outsole having an upper surface, a lower surface, a heel area and a toe area, the lower surface designed for contact with the ground and comprising a multiplicity of lugs;

(b) a midsole positioned above the upper surface of the outsole and adhered to at least a portion of the outsole; and

(c) a stiffener positioned on the upper surface of the outsole and adhered to at least a portion of the outsole, the stiffener extending along a longitudinal axis of the outsole and having a plurality of torsion bars corresponding to the lugs in the heel area of the outsole, whereby the lugs in the heel area of the outsole are able to telescope in a generally vertical direction between the torsion bars and into the midsole.

13. A stiffener for use in footwear, the stiffener having a longitudinal axis with a metatarsal area and a heel area, and being of graduated rigidity, with the heel area having a greater rigidity than the metatarsal area.

14. The stiffener of claim 13 having graduated thickness, with the heel area being thicker than the

metatarsal area.

15. The stiffener of claim 13 having a plurality of perforations located in the metatarsal area.

16. The stiffener of claim 13 having a plurality of elongated perforations located in the metatarsal area and oriented generally perpendicular to the longitudinal axis of the stiffener.

FIG. 1

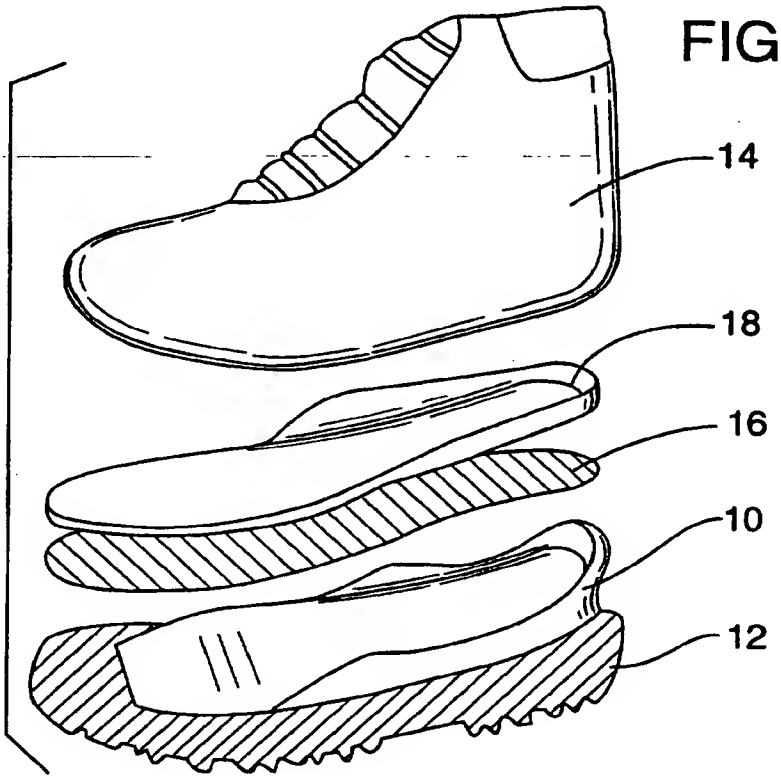
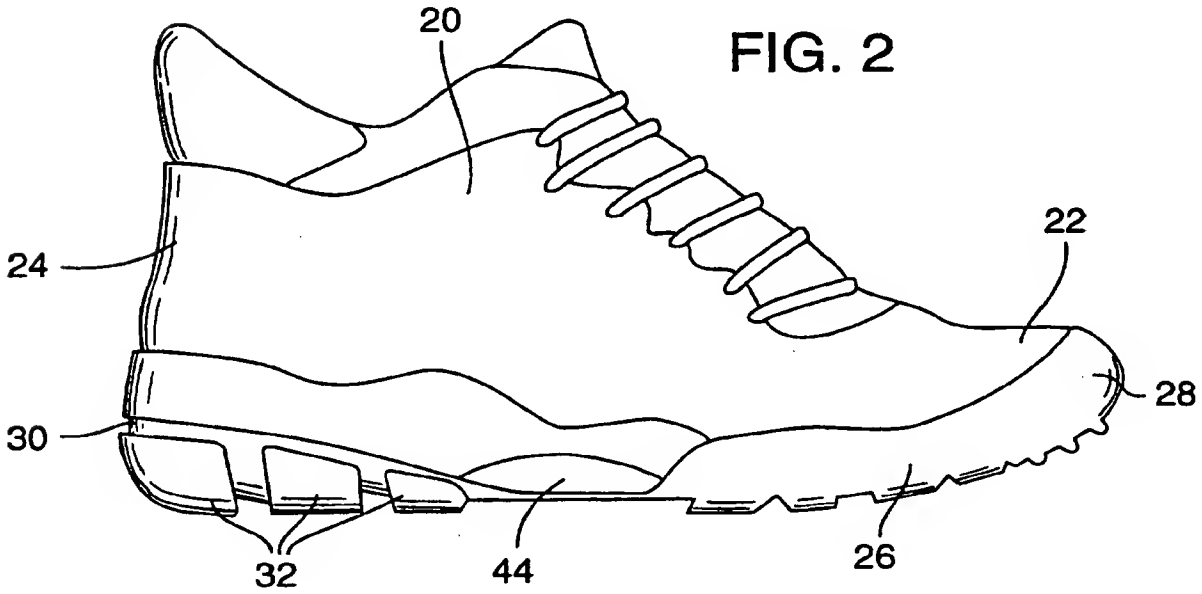


FIG. 2



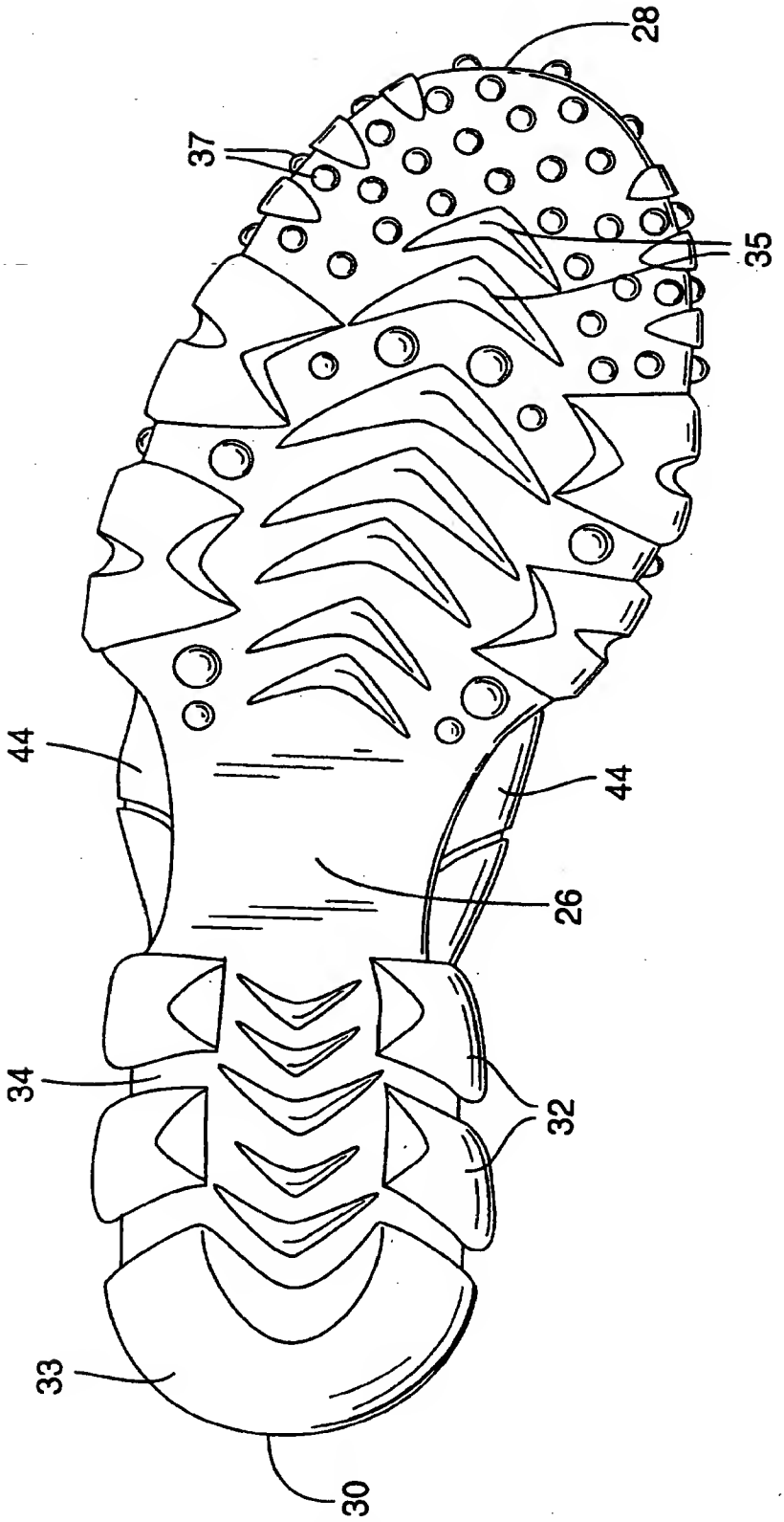


FIG. 3

FIG. 4

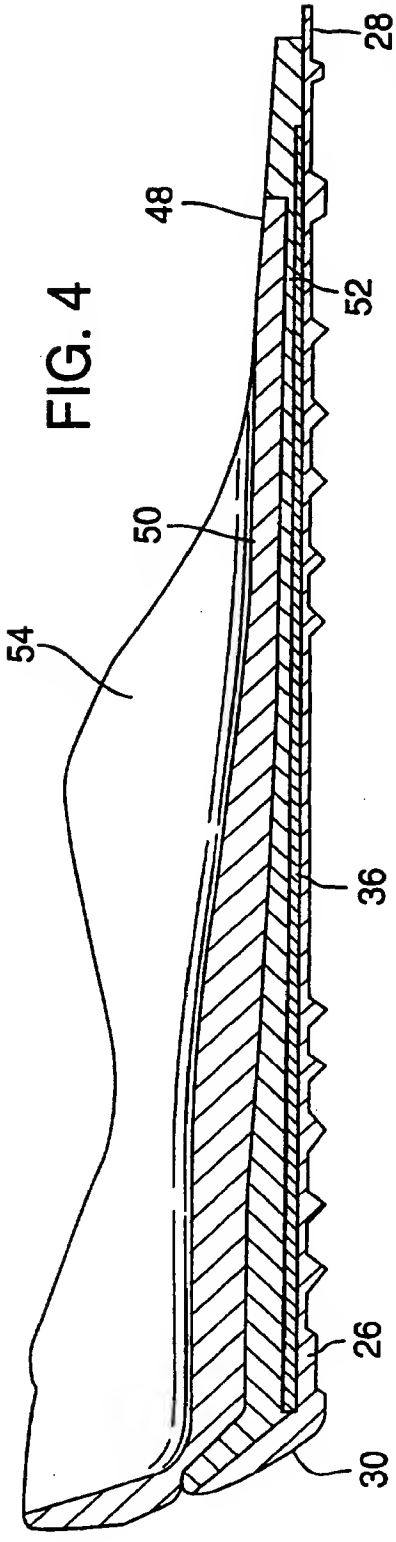


FIG. 5A

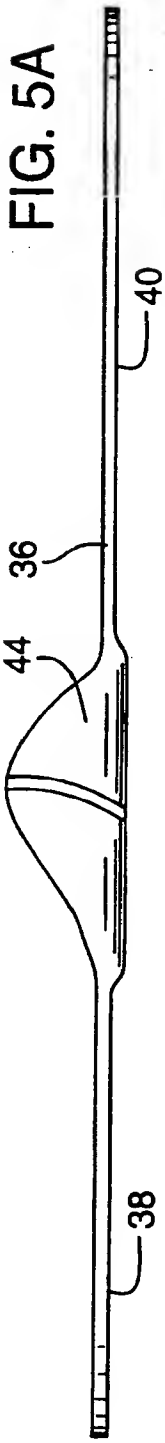
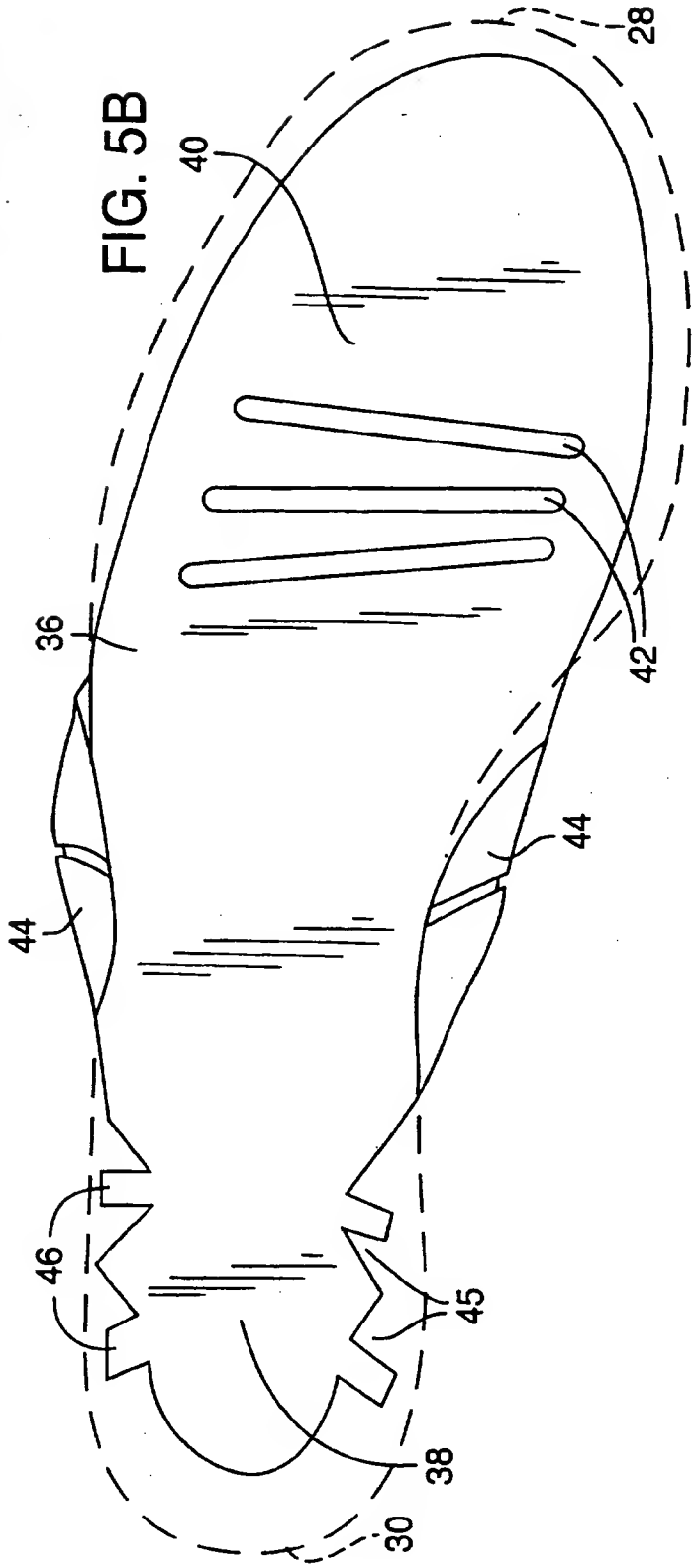


FIG. 5B



INTERNATIONAL SEARCH REPORT

Int. ional Application No
PCT/US 94/10118

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 A43B13/12 A43B5/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 A43B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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X	EP,A,0 548 475 (SALOMON S.A.) 30 June 1993	1,13,15, 16
A	see column 4, line 6 - line 7 see column 6, line 40 - column 7, line 22; figures	2,4,5,7, 12

X	EP,A,0 434 076 (MAYER) 26 June 1991	1,2,4,5, 12-16
	see column 1, line 55 see column 3, line 49 - column 4, line 8 see column 4, line 38 - line 50 see column 8, line 11 - line 27 see claim 17; figures	

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[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
23 January 1995	22 -02- 1995

Name and mailing address of the ISA	Authorized officer
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US-A-4561195	31-12-85	DE-A-	3329742	05-07-84
CA-A-867576	06-04-71	NONE		

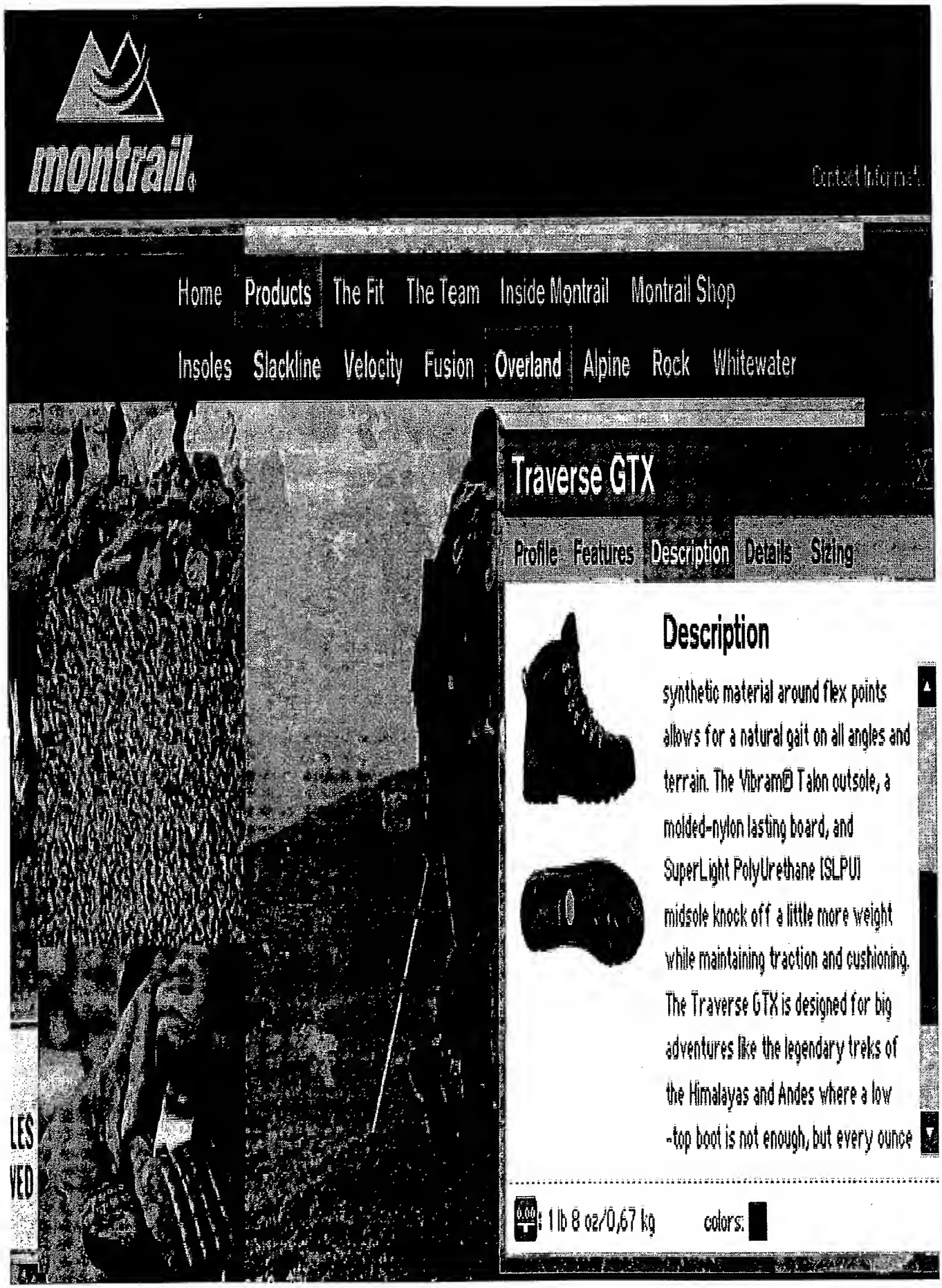

Exhibit D
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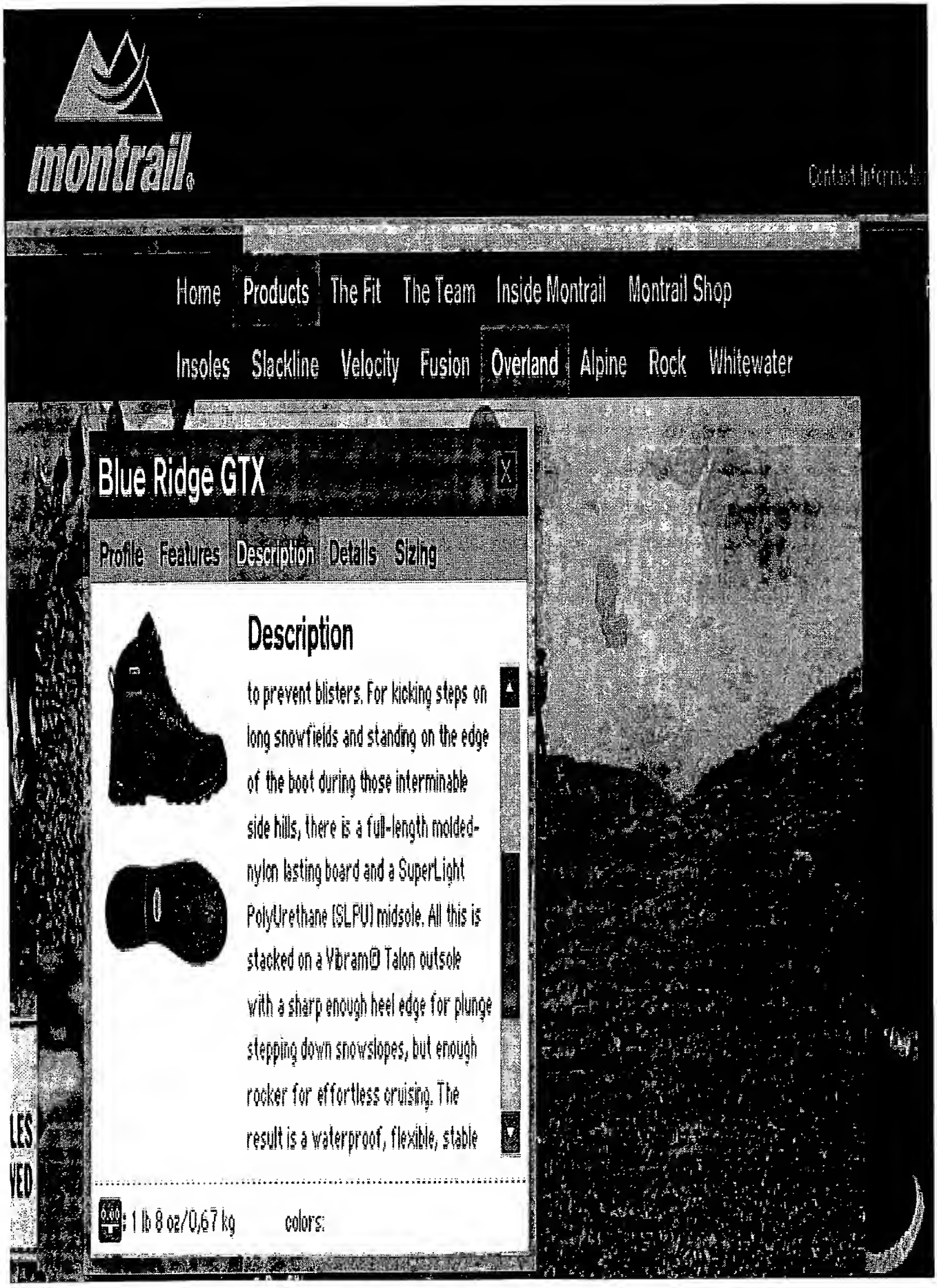
montrail.
Contact Information
Home
Products
The Fit
The Team
Inside Montrail
Montrail Shop
Insoles
Slackline
Velocity
Fusion
Overland
Alpine
Rock
Whitewater
Blue Ridge GTX
Profile
Features
Description
Details
Sizing
Description
to prevent blisters. For kicking steps on long snowfields and standing on the edge of the boot during those interminable side hills, there is a full-length molded-nylon lasting board and a SuperLight PolyUrethane (SLPU) midsole. All this is stacked on a Vibram® Talon outsole with a sharp enough heel edge for plunge stepping down snowslopes, but enough rocker for effortless cruising. The result is a waterproof, flexible, stable
1 lb 8 oz/0,67 kg
colors:

CHAUSSURE ECCO

Exhibit E
Declaration of Anne Laurent
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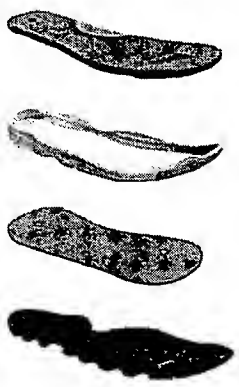
EUROPE FOOTWEAR
SPRING 2006

Columbia
Sportswear Company.

TRAIL SANDALS



FOOTBED: Contoured molded EVA footbed with Sensia™ cover – provides anti-odor treatment and extra level of comfort.

UPPER INSOLE: XTS™ (Cross-Terrain Suspension™) – TPU stability plate sandwiched between the midsole and outsole – provides torsional rigidity, agility plus protection.

MIDSOLE: Compression molded EVA – provides lightweight durability and maximum cushioning and flexibility.

OUTSOLE: Non-marking Omni-Grip™ sticky rubber compound with multi-directional lug pattern – provides excellent off-road traction and stability.

Construction for: BM/L4167, BM/L4165, BM/L4168

TITANIUM

FOOTBED: Removable, anatomically contoured EVA footbed with Dri-Lex™ mesh top cover for extra cushioning, comfort and moisture wicking.

UPPER INSOLE: Full Strobel™ lasted construction, allows for minimal weight and maximum flexibility.

LOWER INSOLE: XTS™ (Cross-Terrain Suspension™) – Dual-density TPU stability plate sandwiched between the midsole and outsole – provides torsional rigidity, agility plus protection.

MIDSOLE: Compression molded EVA midsole – provides flexible, lightweight cushioning.

OUTSOLE: Low profile non-marking Vibram® rubber compound with lug tread pattern – provides maximum traction with minimal weight on all surfaces Additional Vibram® rubber toe cap for more protection and enhanced grip.

Construction for: BM/L3145, BM/L3147, BM/L3167

RUGGED WALKING

FOOTBED: Removable, anatomically contoured EVA footbed with mesh top cover provides cushioning and comfort.

UPPER INSOLE: Slip-lasted construction – fully Strobel™ stitched – allows for minimal weight and maximum flexibility.

SHANK: Molded nylon shank provides torsional rigidity and support.

MIDSOLE: Compression molded EVA midsole provides flexible, lightweight cushioning.

OUTSOLE: Low profile non-marking Omni-Grip™ rubber lug outsole provides traction, stability with minimal weight on all surfaces.

Construction for: BM/L3163

PROGRESSIVE TRAIL #1

FOOTBED: Removable contoured EVA footbed – provides cushioning and comfort.

UPPER INSOLE: Combination Board and Slip lasted construction, provides stability while maintaining flexibility.

LOWER INSOLE: XTS™ (Cross-Terrain Suspension™) – TPU stability plate sandwiched between the midsole and outsole – provides torsional rigidity, agility plus protection.

MIDSOLE: Compression molded EVA midsole – provides flexible, lightweight cushioning.

OUTSOLE: Low profile non-marking Omni-Grip™ rubber lug outsole – provides traction, stability with minimal weight on all surfaces.

Construction for: BM/L3158, BM/L3168, BM/L3132, BM/L3159

PROGRESSIVE TRAIL #2

FOOTBED: Removable contoured EVA footbed – provides cushioning and comfort. Hybrid shoes (4182, 4183) include anti-odor treatment on cover.

UPPER INSOLE: Full Strobel™ lasted construction, allows for minimal weight and maximum flexibility.

LOWER INSOLE: XTS™ (Cross-Terrain Suspension™) – TPU stability plate sandwiched between the midsole and outsole – provides torsional rigidity, agility plus protection.

MIDSOLE: Compression molded, dual-density EVA midsole, with softer pad in forefoot – provides flexible, lightweight cushioning.

OUTSOLE: Low profile non-marking Omni-Grip™ rubber lug outsole – provides traction, stability with minimal weight on all surfaces.

Construction for: BM/L3169, BM/L3164, BM/L4182, BM/L4183

OUTDOOR

FOOTBED: Removable contoured EVA footbed – provides cushioning and comfort.

UPPER INSOLE: Full Strobel™ lasted construction, allows for minimal weight and maximum flexibility.

MIDSOLE: Compression molded EVA midsole – provides flexible, lightweight cushioning.

SHANK: Midfoot reinforcement shank – provides torsional rigidity and support.

OUTSOLE: Low profile non-marking Omni-Grip™ rubber lug outsole – provides traction, stability with minimal weight on all surfaces

Construction for: BM/L3172, BM/L3173

TRAILHEAD

FOOTBED: Removable contoured EVA footbed – provides cushioning and comfort.

UPPER INSOLE: Full Strobel™ lasted construction, allows for minimal weight and maximum flexibility.

MIDSOLE: Molded and die-cut EVA midsoles – provides flexible and lightweight cushioning.

SHANK: Midfoot reinforcement shank – provides torsional rigidity and support.

OUTSOLE: Non-marking Omni-Grip™ partial rubber cupsole – provides traction and stability on all surfaces.

Construction for: BM/L3165, BM/L3139, BM/L3128

90

GARMONT
challenge the elements

Exhibit G
Declaration of Anne Laurent
U.S. Application Serial No. 09/994/059

OUTDOOR FITNESS

01

02

03

01 Midsole
Compression moulded EVA
To be fast and multi-directional responsive, it has to be cmEVA. High rear/midfoot wrap is weight-efficient stability feature plus buffers support strength of TPU spine. Forefoot is anatomically scored for easy flex.

02 TPU Spine
The strength-to-weight ratio of TPU is bolstered by intricate moulded ribs. A macro concave arc longitudinally in heel disperses shock and adds stability. Micro arced convex ribs angled medially in the heel and laterally at mid to forefoot resist pronation and supination respectively, where most commonly needed. 35 mm deep cupping midfoot supports the foot in this most dynamic and mobile compartment

03 RhinoStrike outsole
Traction at any angle of attack or exit is obvious from super 3D design. Heelstrike and forefoot cupping protects midsole. The oversize ball-of-foot lug makes speedy directional adjustments feel natural. Extended integral toe bumper enhances overall structure and forgives our sins when toe meets trail, or rock, or root. The most integrated spine system yet. Outsole lugs are very specifically located to support stability ribs of spine. As the Rhino is very protective, so is the Rhino outsole - protective of biomechanical insults by complimenting stability of spine and adding stability of its own. Protective of mechanical insults through a highly protective front end.

ABOUT MONTRAIL

Montrail is an eccentric brand. While we live in a marketplace dominated by mainstream products, trends, and fashions, Montrail devotes itself to the fringe cultures of ultrarunning, adventure climbing, super-light trekking, and playboating. Why pour so much energy and thought into such a tiny niche? Because adventure is the spice of life in our sitcom world! These are the passions that inspire and motivate us, the experiences that shape and color our lifestyles.

Our chosen specialties demand the most out of our products. We must pay exacting attention to fit, quality, and technology. We build all products with our IntegraFit™ system for better comfort and performance, and we continually research new materials and innovative designs and technologies. This gives us the satisfaction of providing every one of you who is out there getting after it, with better products to better pursue your passions.

TECHNOLOGY

INTEGRAFIT®

IntegraFit® is the core technology that governs the fit of all Montrail footwear. The IntegraFit® last was developed using digitized foo scans from 800,000 pairs of feet. This accounts for the supportive feel in the arch, the firm heel hold, and the smooth contact pressur for a variety of foot shapes.

CTX™

CTX™ thermo-moldable foam is a revolutionary technology that allows footwear to be custom molded to the exact shape of your foot This specially formulated foam conforms to match your foot shape, bone spurs, and irregularities when warmed to the modest tempera ture of 225° F (107°C) for two to three minutes and then worn until cool.

GRYPTONITE™

While researching climbing shoe technology we created the Gryptonite™ family of compounds, which combine extremely high frictior with the appropriate hardness and durability for the given activity.

- HT • **HT** (High Test) has the highest coefficient of friction of any climbing rubber available. We didn't believe it either until we tried it.
- GC • **GC** (Climbing) is durable, but sticky on both wet and dry rock.
- GT • **GT** (Trail) is non-marking and has great friction on a variety of trail conditions while being hard enough for high mileage.
- GS • **GS** (Smearing) is non-marking like GT but emphasizes friction over hardness.

TERRAFLEX™

TerraFlex™ is the three-component technology combining a high-traction outsole, a protection plate, and a shock absorbing midsole. This original design allows extremely lightweight shoes to provide traction, protection, and cushioning.

GORE-TEX®

Montrail uses GORE-TEX® technologies in innovative ways to improve the comfort and performance of our waterproof/breathable footwear.

- **EXO** places the GORE-TEX® fabric on the outside of the footwear so it repels the water before it can be absorbed into the shoe upper.
- **XCR** footwear is highly breathable as demanded by light and fast users and is found in our Fusion and Velocity lines.
- **GTX** is the most durable for our stoutest footwear.

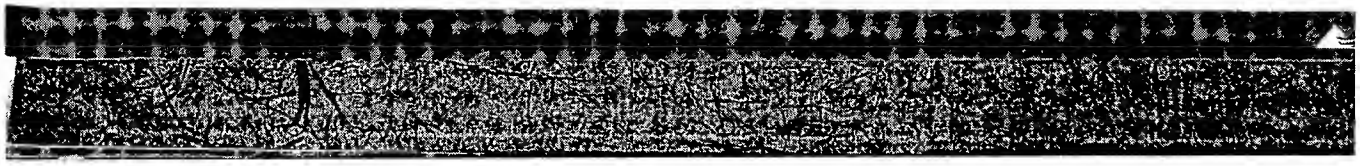
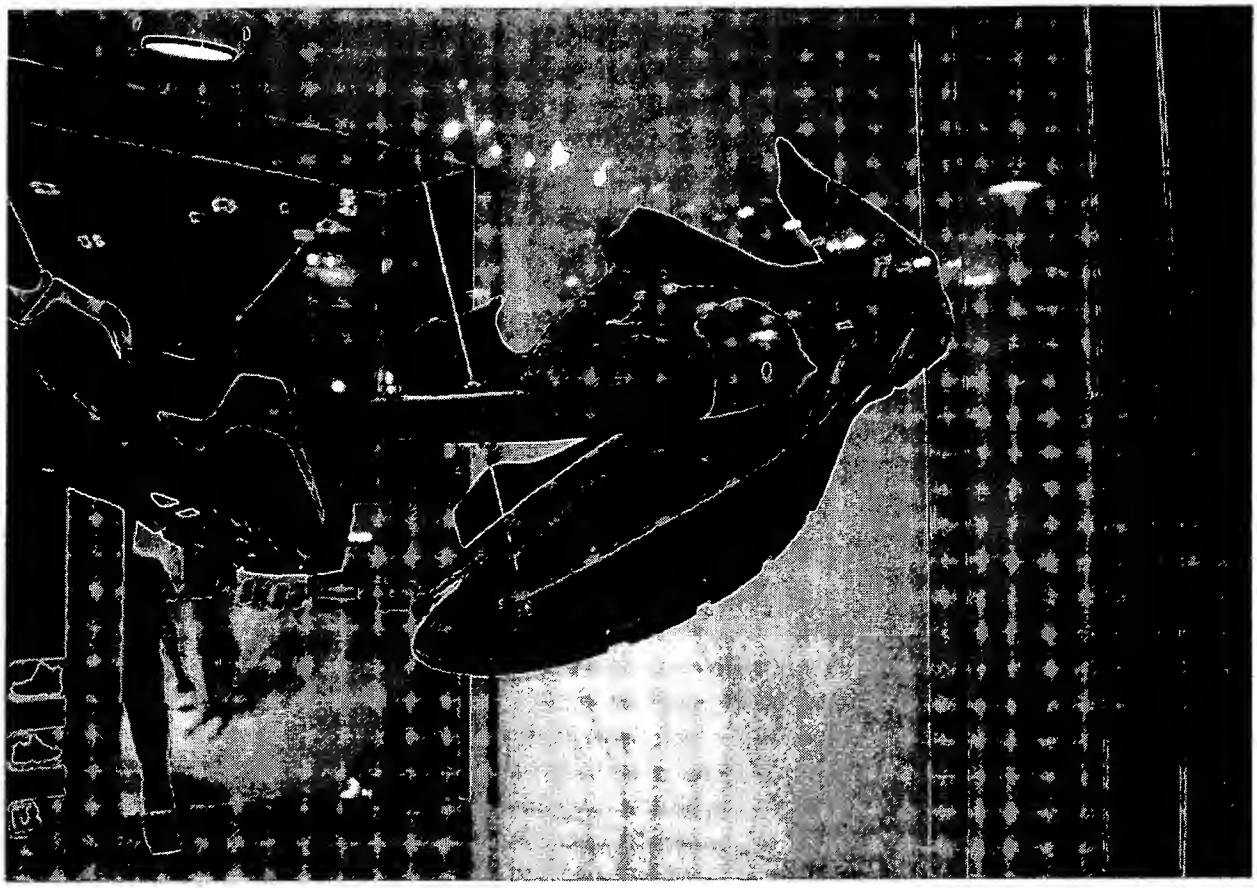


Exhibit H
Declaration of Anne Laurent
U.S. Application Serial No. 09/994/059

Chaussure NIKE - Semelle TRI CUSHIE



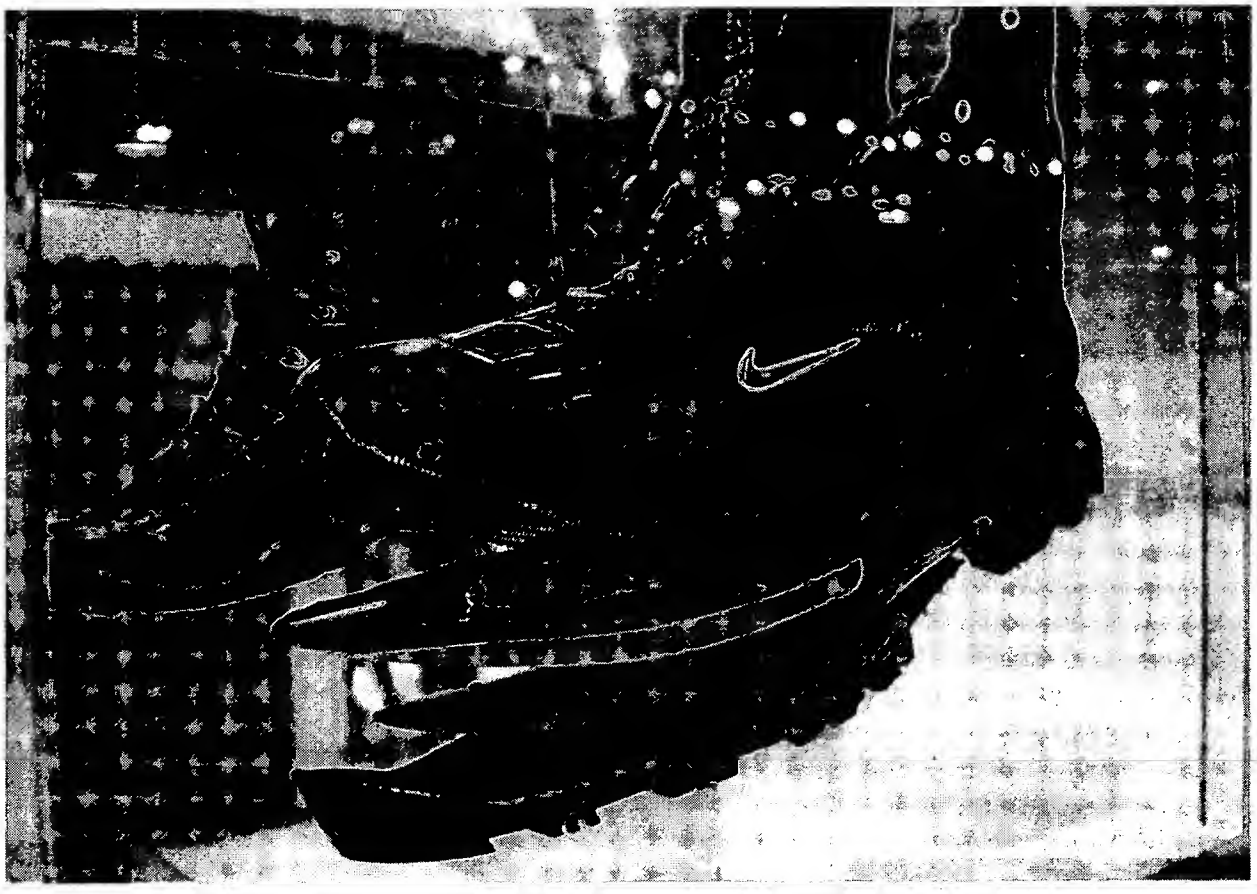


Exhibit 1
Declaration of Anne Laurent
U.S. Application Serial No. 09/994/059

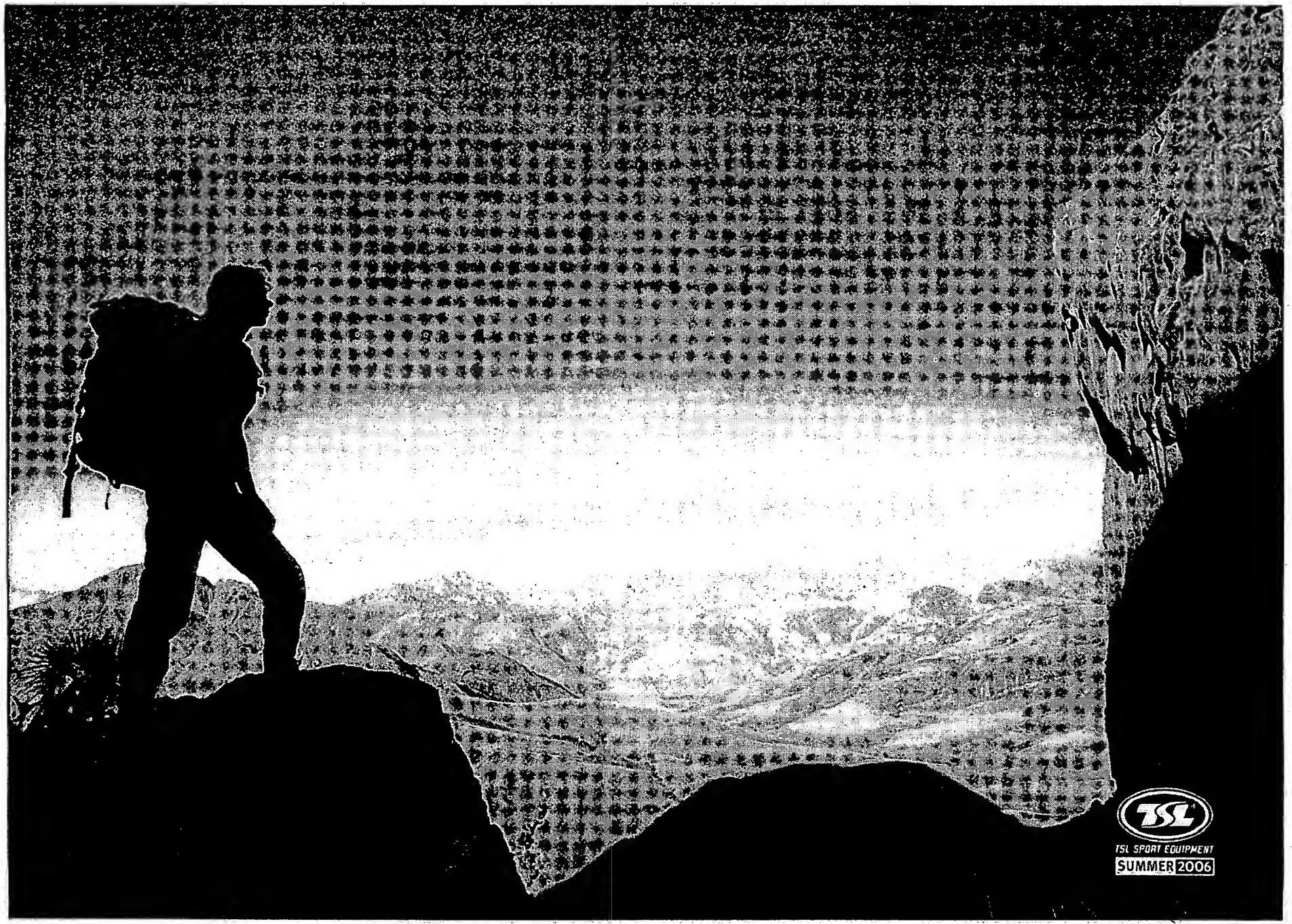


Exhibit J
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MATERIAUX / MATERIALS / MATERIALIEN / MATERIALI / MATERIALES

Vibram®

La référence de la semelle : résistant à l'abrasion
Simply the best of sole : resistant to abrasion
Die Referenz der Sohlen : Abriebfester
Il riferimento della suola : resiste all'abrasione
La referencia de la suela : resistente a la abrasión

HYPERGRIP

Semelle à adhérence optimale
Excellent grip sole
Exzellente Haftung Sohlen
Grip eccelente della suola
Adherencia óptima de suela

COR

Tissu technique résistant à l'abrasion (enduction hydrophobe)
Technical fabric, resistant to abrasion (waterproof coating)
Abriebfester High-Tech-Stoff (mit wasserabweisendem Überzug)
Tessuto tecnico che resiste all'abrasione (rivestimento idrofobo)
Tejido técnico resistente a la abrasión (revestimiento hidrófobo)

ADVANCE PROTEK w/b

Membranes imper-respirantes
Waterproof and breathable membranes
Wasser undurchlässige, atmungsaktive Membranen
Membrane impermeabili traspiranti
Membranas impermeables-transpirables

CHAUSSURES RANDO
TREKKING SHOES
WANDERSCHUHE
SCARPE DA TREKKING
BOTAS DE MONTANA

- Montage sur forme
- Semelle VIBRAM®
- Coutures imperméables
- Languette soufflet monobloc

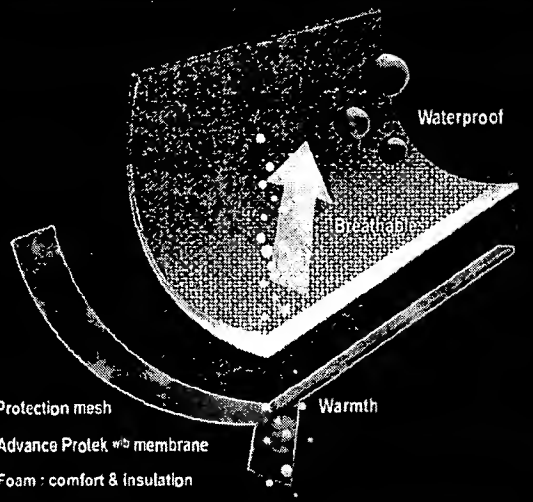
- Cemented construction
- VIBRAM® sole
- Waterproof seams
- Seamless tongue

- Konstruktion auf Grundsohle
- VIBRAM® Sohle
- Wasserdichte Nähte
- Nahtlose Zunge

- Montaggio su forma
- Suola VIBRAM®
- Cuciture impermeabili
- Linguetta a soffietto monoblocco

- Montaje en horma
- Suela VIBRAM®
- Costuras impermeables
- Fuelle monobloque

ADVANCE PROTEK w/b *waterproof & breathable technology*



VASQUE

SEEK
CLIMB
HIKE
RUN

VASQUE
2005

Exhibit K
Declaration of Anne Laurent
U.S. Application Serial No. 09/994/059

SKYWALK® FITZROY W/ STEALTH®

Insulated Footbed

Carbon Fiber Insole with Foam Insulation

EVA Midsole

Skywalk Fitzroy Outsole w/ Stealth MT Rubber

Stealth High Friction MT Rubber for rock, ice and snow

Used on styles:

Ice 9000: 7550
Super Alpinista: 7548

7546
Yellow/Black
NEW

7544 / 7545
Graphite
NEW

M-FINITY

400 gram Thinsulate

Unisex Sizes: Medium 6-12,13,14
Weight: 4 lbs. 4 oz. (mens 9)

- Upper: Kevlar/Nylon Fabric, TecTuff & Split Leather
- Insole: Carbon Fiber
- Midsole: EVA
- Outsole: Vibram Kommandos
- Lining: Driex
- Footbed: Insulated
- Other: Padded Collar, Rubber Toe Rand, Step-In Crampon Compatible, Waterproof Membrane, 400 gram Thinsulate™ Insulation

Waterproof Kevlar fabric uppers and carbon fiber lasting boards reduce weight and bulk to make this performance-oriented boot perfect for modern mixed routes and steep ice cragging.

ALPINE GTX

7544 Men's Sizes: Medium 7-12,13,14, Wide 8-11
Weight: 4 lbs. 5 oz. (mens 9)
7545 Women's Sizes: Medium 6 -10
Weight: 3 lbs. 11 oz. (womens 7)

- Upper: Graphite 3 mm Waterproof Split Leather
- Insole: Bimodal 4
- Midsole: EVA
- Outsole: Vibram Granito
- Lining: 3-Bar Knit Nylon
- Footbed: Dry-tech
- Other: Gemini Double Tongue, Padded Collar, Rubber Toe Rand, Mixed Crampon Compatible, Roller-ball Hardware, GORE-TEX Membrane

Equally comfortable on extended alpine treks or peak bagging expeditions to 14ers the world over, this light-duty leather mountaineering boot has a GORE-TEX® liner and supportive-yet-flexible Vibram® sole with mixed crampon compatibility.

MAKO TRAIL RUNNING

VFS™ Dual Density Footbed

Dual Density Contoured Compression Molded EVA Midsole

Torsion Control Plate

Mako Trail Running Outsole

Grips the trail and provides stability, cushioning and motion control

Used on styles:

Velocity:
7600, 7601, 7604, 7605, 7609, 7624, 7627
Velocity GTX XCR:
7612, 7613
Lightspeed:
7616, 7618, 7619, 7620, 7621, 7623

7605
Pink/Ash
NEW!

7627
Lichen/Ash
NEW!

7601
Light Blue

7609
Grey

Lightspeed >

"Über-ventilation. Cool protection for hot runs."

OUTSIDE MAGAZINE
Buyer's Guide 2004

7613 GTX XCR
Graphite

VELOCITY

Women's Sizes:
Medium 5-11 7601: Also in Wide 7-10
Weight: 1 lb. 7 oz. (womens 7)

- Upper Leather: Synthetic Nubuck and Airmesh
- Upper Fabric: Airmesh Nylon
- Midsole: Dual Density EVA
- Outsole: Vasque Mako
- Lining: Nylon
- Footbed: Dual Density EVA
- Other: Beneke-Ceroprene Rand, Running Last

Built for motion control on rugged trail runs, the Velocity's dual-density EVA midsole reduces pronation while TPU-reinforced Airmesh and synthetic leather uppers provide support. Vasque Mako outsole offers superb traction.

VELOCITY

Women's Sizes:
Medium 5-11 7601: Also in Wide 7-10
Weight: 1 lb. 7 oz. (womens 7)

- Upper Leather: Synthetic Nubuck and Airmesh
- Upper Fabric: Airmesh Nylon
- Midsole: Dual Density EVA
- Outsole: Vasque Mako
- Lining: Nylon
- Footbed: Dual Density EVA
- Other: Beneke-Ceroprene Rand, Running Last

Built for motion control on rugged trail runs, the Velocity's dual-density EVA midsole reduces pronation while TPU-reinforced Airmesh and synthetic leather uppers provide support. Vasque Mako outsole offers superb traction.

VELOCITY GTX XCR

Women's Sizes:
Medium 5-11
Weight: 1 lb. 8 oz. (womens 7)

- Upper: Synthetic Nubuck and Airmesh
- Midsole: Dual Density EVA
- Outsole: Vasque Mako
- Lining: Nylon
- Footbed: Dual Density EVA
- Other: Beneke-Ceroprene Rand, Running Last

Built for motion control on rugged trail runs, the Velocity's dual-density EVA midsole reduces pronation while TPU-reinforced Airmesh and synthetic leather uppers provide support. Vasque Mako outsole offers superb traction. GORE-TEX® keeps feet dry.

VIBRAM® CONTACT

Dual Density EVA

Compression Molded EVA Midsole

Flexframe 2 Plate

Vibram® Contact Outsole

Offers the perfect blend of flexibility, traction and support for dayhikes or light overnights

Used on styles:

Hiking
Caldera: 7441, 7442, 7443, 7444

Fast Packing
Breeze: 7452, 7453, 7462, 7463
Breeze Low: 7454, 7464, 7450, 7460, 7455, 7461, 7451, 7459

7441
Shark

7443 GTX
Mushroom

7217
Tan/Sage

7219 GTX
Brown/Grey

7433 GTX
Grey/Olive

CALDERA

Women's Sizes:
Medium 5-11
Weight: 2 lbs. 1 oz. (womens 7)
GTX: 2 lbs. 3 oz.

- Upper: 2mm Waterproof Nubuck Leather
- Midsole: Contoured EVA
- Outsole: Vibram® Contact
- Lining: Nylon
- Footbed: Dual Density EVA
- Other: Integration Technology with Flexframe 2 Plate

Strobel lasted for a comfortable, agile feel, this boot keeps the pace up on strenuous day hikes over rough terrain, and even carries loads on short backpacking trips. The exclusive Vibram® Contact outsole utilizes a nylon plate for protection and stability.

RANGER 2

Women's Sizes:
Medium 5-11
Weight: 2 lbs. 6 oz. (womens 7)
GTX: 2 lbs. 7 oz.

- Upper: 2.0mm Waterproof Split Leather and Nylon Fabric
- Midsole: EVA
- Outsole: Vasque Scout
- Lining: Nylon
- Footbed: Contoured EVA

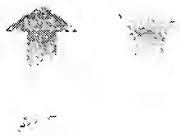
The women's Ranger 2 features a redesigned, more durable bottom package, updated styling, and a women's specific last – all at a price that make this updated classic one of Vasque's best values.

MICA GTX

Women's Sizes:
Medium 5-11, Wide 7-10
Weight: 2 lbs. 6 oz. (womens 7)

- Upper Leather: 2.0mm Waterproof Nubuck & Split
- Upper Fabric: Nylon
- Insole: Monoflex Lite
- Midsole: EVA
- Outsole: Vibram® Lite Run
- Lining: 3-Bar Knit Nylon
- Footbed: DryTech
- Other: Padded Collar, TecTuff Rand, GORE-TEX Membrane

Supportive board lasting and a molded heel counter make this light hiker stable and comfortable on long trail walks. An optional GORE-TEX® bootie and athletically-styled leather and fabric uppers keep feet dry without sacrificing breathability.

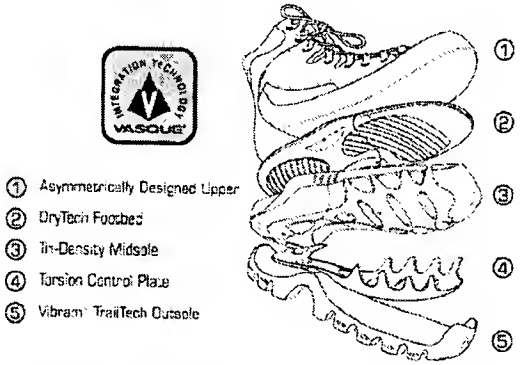


Airmesh Technology

Airmesh fabric is an abrasion-resistant, three dimensional fabric that has been engineered to provide a very open pore structure to deliver unparalleled breathability. The lining and the exterior fabric are actually produced as one integral layer, eliminating the need for additional adhesives or backings that can limit airflow.

Gore-Tex® XCR® Technology

The primary attribute associated with GORE-TEX® XCR® footwear is comfort. Exceptional breathability is achieved without sacrificing waterproof protection. The end result is highly breathable, durably waterproof footwear... translation: very comfortable, happy feet. Footwear with a GORE-TEX® XCR® membrane is well suited for high aerobic activities and warm temperature environments. "If it doesn't say GORE-TEX®, it's not."



Integration Technology System

What is I.T.? It's Vasque's Integration Technology System where the total is greater than the sum of its parts. Built on a proprietary Vasque last, each technological element is biomechanically designed to maximize performance. When integrated together, each component enhances the function of the entire system.

Gore-Tex® Technology

A sophisticated membrane system combined with proven manufacturing techniques makes GORE-TEX® footwear waterproof, breathable, and comfortable. External water is repelled while internal moisture is allowed to pass through the membrane, keeping feet dry and comfortable. GORE-TEX® footwear provides time-tested durability, and delivers on its Guaranteed To Keep You Dry® promise.

STEALTH® high friction rubber

Stealth® Rubber

The highest friction rubber available, Stealth® also provides maximum shock absorption. Each of Stealth®'s unique compounds are engineered to provide optimal characteristics for specific activities and conditions. Stealth® is your guarantee of exceptional performance on any angle terrain.

Vibram®

Exceptional design intersects with innovative rubber compounds to create versatile, performance outsoles. Art meets function, experience confronts the future, Vibram® outsoles are poetry in motion. Proven over time, these soles offer excellent traction and high abrasion resistance in a multitude of environments.

FOOTWEAR SIZE COMPARISON CHART FOR MOST COMMON INTERNATIONAL SYSTEMS

USA MEN'S	3.5	4	4.5	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10	10.5	11	11.5	12	13	14	15	16
USA WOMEN'S	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10	10.5	11									
EUROPEAN	35	35.5	36	37	37.5	38	38.5	39.5	40	40.5	41.5	42	42.5	43	44	44.5	45	45.5	47	48	49	50
BRITISH	2.5	3	3.5	4	4.5	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10	10.5	11	12	13	14	15
JAPANESE	21.5	22	22.5	23	23.5	23.5	24	24.5	25	25.5	26	26	26.5	27	27.5	28	28.5	29	29.5	30	31	31

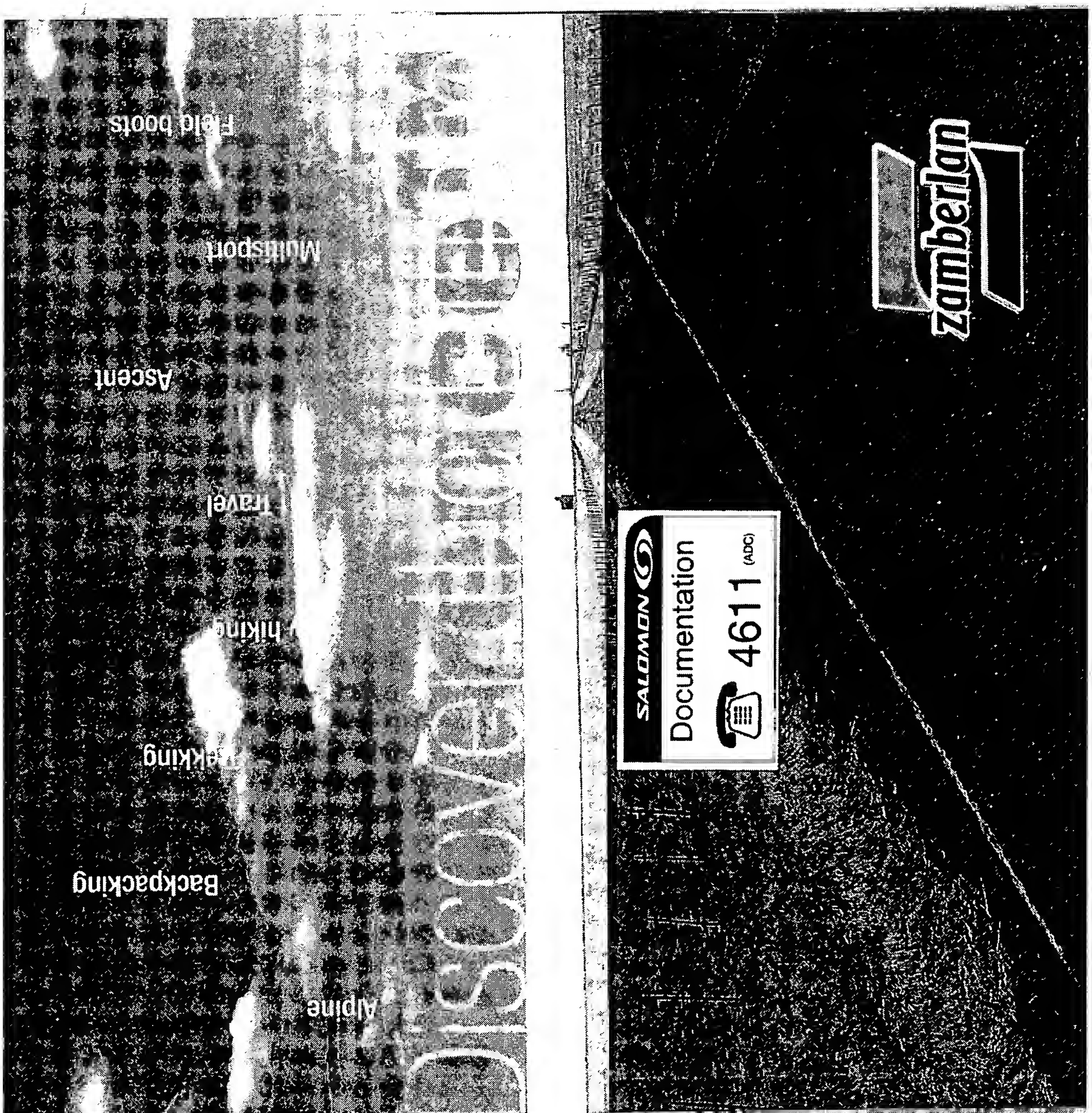


Exhibit L
Declaration of Anne Laurent
U.S. Application Serial No. 09/994/059

alzatura bassa, leggera e molto comfortevole. Adatta a molteplici attività all'aria aperta. La suola Zamberlan Wave in gomma/EVA con inserto stabilizzatore in TPU è studiata per ottimi grip e comfort su ogni tipo di terreno

ow cut, light weight and comfortable shoe. Suitable for a number of outdoor ctivities. The Zamberlan Wave rubber sole with full length TPU plant provides good grip and comfort on any type of terrain.

omaia / Upper: Hydrobloc Split Leather/Cordura
odera / Lining: Dri-lex
uola / Sole: Zamberlan Wave
olore / Color: Grey / Dk Blue, Grey / Bordeaux
aglia / Size: Euro 42-46 USA Men's 8 - 12,13
eso* / Weight*: gr. 370 (size 39)

MICROTEX Wave

Scarpa dal taglio medio in scamosciato/Cordura, adatta all'uso su e fuori sentiero per svariate attività sportive all'aperto. La fodera in GORE-TEX® XCR fornisce protezione all'acqua e ottima traspirabilità. La suola Zamberlan Wave garantisce buo grip, trazione, ottimo assorbimento dell'impatto sul terreno e leggerezza.

Strong and supportive mid cut fabric shoe, good for use on and off trail and for multisport activities. The GORE-TEX® XCR lining grants great water protection and enhanced breathability and ventilation and the Zamberlan Wave sole ensures good grip, traction, great shock absorption and light weight.

Tomaia / Upper: Hydrobloc Split Leather/Cordura
Fodera / Lining: GORE-TEX® XCR
Suola / Sole: Zamberlan Wave
Colore / Color: Olive / Green, Grey / Lt Grey
Taglia / Size: Euro 42-48 USA Men's 8 - 12,13
Peso* / Weight*: gr. 550 (size 42)

MICROTEX Wave Easi HYDRO BLOC

MULTISPORT

tzatura bassa, leggera e molto comfortevole su una forma specifica per il ede femminile. Adatta a molteplici attività all'aria aperta. La suola Zamberi Wave in gomma/EVA con inserto stabilizzatore in TPU è studiata per ottimi ip e comfort su ogni tipo di terreno.

w cut, light weight and comfortable shoe. Suitable for a number of outdoor tivities. The Zamberlan Wave rubber sole with full length TPU plant provis good grip and comfort on any type of terrain.

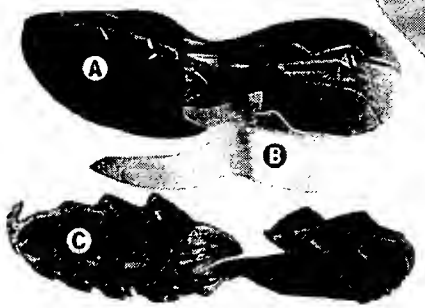
maia / Upper: Hydrobloc Split Leather/Cordura
idera / Lining: Dri-lex
iola / Sole: Zamberlan Wave
ilore / Color: Grey / Bordeaux
glia / Size: Euro 36-43 USA Wms 6 - 10, 11
so* / Weight*: gr. 430 (size 42)

MICROTEX Wave

Wave

La suola a tre strati Zamberlan per le scarpe "Multisport", molto leggera ma con un elevata capacità di assorbimento ed antifatica. I chiodi del battistrada sono posizionati in maniera specifica per assicurare grip, trazione e stabilità, il plate in TPU garantisce protezione, stabilità e rigidità torsionale, la zeppa in EVA termoformata assicura grande comfort ed assorbimento dell'impatto del piede sul terreno.

Zamberlan three layer sole for the "Multisport" footwear, extremely light yet very protective, to ensure ideal overall lightweight and prevent fatigue.
The durable rubber outersole features specifically positioned lugs to ensure great grip for off road traction and stability on the trails; the middle layer consists of a TPU molded plate that covers the whole length of the sole for maximum protection, stability and torsional rigidity; the top layer in compression molded EVA will ensure great comfort, shock absorption and cushioning.



A Intersuola EVA termoformata
Compression molded EVA

B Stabilizzatore TPU
TPU plate

C Battistrada in gomma
Aggressive pattern rubber outersole